

SOUTHWORTH

LS SERIES

LSX-24, LSX-36, LSX-48

For machines shipping no earlier than June, 2023



Model: _____

Serial Number: _____

Date placed in service: _____

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Owner Manual

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 WARNING
Cancer and Reproductive Harm - www.P65Warnings.ca.gov

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www.P65Warnings.ca.gov

1 INTRODUCTION

1.1 Responsibilities of Owner and Users

Basic Principles - Owners/users shall apply sound principles of safety, training, inspection, maintenance to the expected operating environment. It shall be the responsibility of the owner/user to advise the manufacturer where deflection may be critical to the application.

Manuals - Owners/users shall keep and maintain a copy of the operating and maintenance manual(s) and ensure its availability to operating and maintenance personnel.

Inspection and Maintenance - It shall be the responsibility of the users to inspect and maintain the machine as required to ensure proper operation. The frequency of inspection and maintenance shall be based upon the manufacturer's recommendations and be compatible with operating conditions and the severity of the operating environment. Machinery that is not in proper operating condition shall be immediately removed from service until repaired. Maintenance and repairs shall be made by a qualified person and the repairs shall be in conformance with the manufacturer's recommendations.

Maintenance Safety Precautions - Before adjustments and repairs are started on the machine, the following precautions shall be taken as applicable:

1. Remove the load from the platform.
2. Lower platform to the full down position.
3. Relieve system pressure from all circuits before loosening or removing any components.
4. All controls in the "off" position and all operating features secured from inadvertent motion by brakes, blocks, or other means.
5. Disconnect power and follow established owner/user lockout/tag out policies.
6. Follow precautions and directions as specified by the manufacturer.

Replacement Parts - When parts or components are replaced, they shall be replaced with parts or components approved by the original manufacturer.

Maintenance Training - The user shall ensure only qualified personnel inspect and maintain the machine in accordance with the manufacturer's recommendations.

Operator Training - An owner/user, who directs or authorizes an individual to operate the machine shall ensure that the individual has been:

1. Trained in accordance with the manufacturer's operating manual.
2. Made aware of the responsibilities of operators as outlined in section 1.2 of this manual.
3. Retrained, if necessary, based on the owners/user's observation and evaluation of the operator.

Modifications and additions shall not be performed without the manufacturer's prior written approval. Where such authorization is granted, capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

1.2 Responsibilities of Operators

Basic Principles - Operators shall apply sound principles of safety and good judgment in the application, and operation of the machine with consideration given to its intended use and expected operating environment. Since the operator is in direct control of the machine, conformance with good safety practices is the responsibility of the operator. The operator shall make decisions on the use and operation with due consideration for the fact that his or her own safety as well as the safety of other personnel on or near the machine is dependent on those decisions.

General Training - Only personnel who have received general instructions regarding the inspection, application, and operation of machine, including recognition and avoidance of hazards associated with their operation, shall operate the machine. Such topics covered shall include, but not necessarily be limited to, the following issues and requirements:

1. A pre-start inspection
2. Responsibilities associated with problems or malfunctions affecting the operation of the machine
3. Factors affecting stability
4. The purpose of placards and decals
5. Workplace inspection
6. Safety rules and regulations
7. Authorization to operate
8. Operator warnings and instructions
9. Actual operation of the machine. Under the direction of a qualified person, the trainee shall operate the machine for a sufficient period of time to demonstrate proficiency in actual operation of the machine.

Pre-start Inspection - Before use each day or at the beginning of each shift, the machine shall be given a visual inspection and functional test including but not limited to the following:

1. Operating and emergency controls
2. Safety devices
3. Hydraulic system leaks
4. Electrical cables and wiring harness
5. Loose or missing parts
6. Nameplates, precautionary and instructional markings and/or labeling
7. Guarding system
8. Items specified by the manufacturer

Problem or Malfunctions - Any problems or malfunctions that affect the safety of operations shall be repaired prior to the use of the machine.

Before Operations - The operator shall:

1. Read and understand the manufacturer's operating instruction(s) and user's safety rules or have them explained.
2. Understand all labels, warnings, and instructions displayed on the machine or have them explained.

Workplace Inspections - Before the machine is used and during use, the operator shall check the area in which the machine is to be used for possible hazards such as, but not limited to:

1. Bumps, floor obstructions, and uneven surfaces
2. Overhead obstructions and electrical hazards
3. Presence of unauthorized persons
4. Other possible unsafe conditions as noted in the operating manual.

Operator Warnings and Instructions - The operator shall ensure the operation of the machine is in compliance with the following:

1. **Guarding system** - Guarding shall be installed and positioned, and access gates or openings shall be secured per the manufacturer's instructions (If applicable).
2. **Distribution of load** - The load and its distribution on the platform shall be in accordance with the manufacturer's rated capacity for that specific configuration.
3. **Maintaining overhead clearance** - The operator shall ensure that adequate clearance is maintained from overhead obstructions and energized electrical conductors and parts.
4. **Point of Operation** - The operator shall not place any part of their body under the platform.
5. **Precaution for moving equipment** - When other moving equipment or vehicles are present, special precautions shall be taken to comply with the safety standards established for the workplace.
6. **Reporting problems or malfunctions** - The operator shall immediately report to a supervisor any problem(s) or malfunction(s) that become evident during operation. The operator shall ensure all problems and malfunctions that affect the safety of operations are repaired prior to continued use.
7. **Capacity limitation** - Rated capacity shall not be exceeded when loads are transferred to the platform.
8. **Work area** - The operator shall ensure the area surrounding the machine is clear of personnel and equipment before lowering the platform.
9. **Securing the machine** - The operator shall comply with the means and procedures provided to protect against use by an unauthorized person(s).
10. **Altering safety devices** - Safety devices shall not be altered or disabled.
11. **Modifications** or alterations of the machine or the fabrication and attaching of frameworks or the mounting of attachments to the machine or the guarding system shall only be accomplished with prior written permission of the manufacturer.
12. **Assistance to the operator** - If an operator encounters any suspected malfunction or any hazard or potentially unsafe condition relating to capacity, intended use, or safe operation, the operator shall cease operation of the machine and request further instruction from the owner/user.
13. **Problems or malfunctions** - Any problem(s) or malfunction(s) that affect the safety of operations shall be repaired prior to the use of the machine.

1.3 Intent of this Manual

A substantial number of feature and function combinations exist when custom equipment is provided by a manufacturer. Images illustrated throughout this manual are only representative samples of designs that may or may not exist in the machine this general manual was provided for. When questioning whether any part of this manual applies specifically to your machine, you may contact customer service with your order number and/or the serial number for your machine, and we will provide the specific drawing(s) that combined with this manual will provide sufficient information to install, test, operate and maintain the equipment.

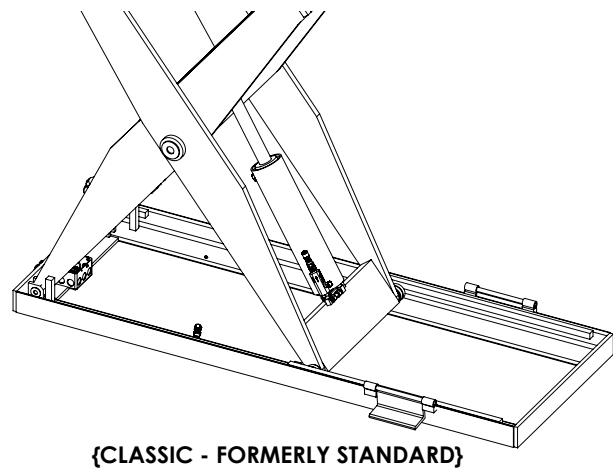
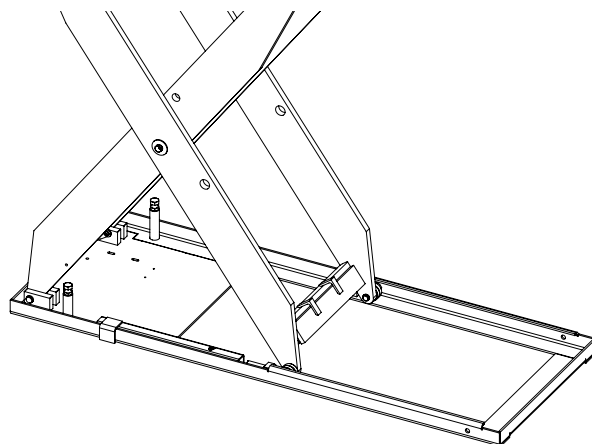
1.4 Quickly Identifying {Standard} vs {Classic} Components

Southworth is constantly innovating and redesigning equipment to better serve our customers. As we develop new **{Standard}** designs, we'll often refer to our former "standard" designs/assemblies/components as **{Classic}** even though these may co-exist in machines going forward. This manual covers information regarding both and this section will aid in identifying each for purposes of installation, operation, maintenance and repair. The descriptor **{Standard}** refers to this section whereas the descriptors standard, [Standard], or (Standard) refer only to other than optional components and assemblies.

There are various factors which prevent us from offering only our **{Standard}** designs, assemblies, and/or components exclusively on our equipment and in these cases, it will be helpful to illustrate what you may see in regard to overall structure, HPU assemblies, and controls.

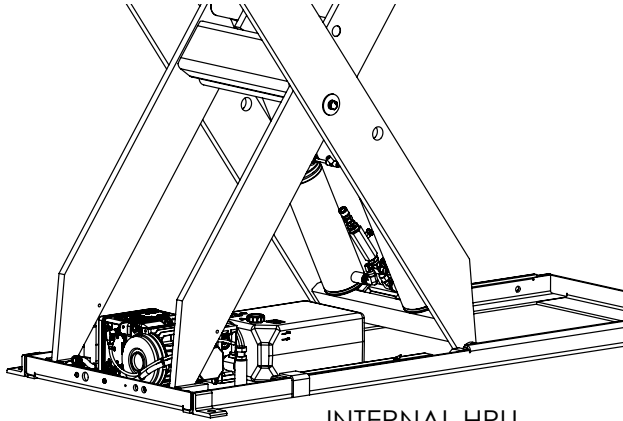
1.4.1 Overall Structure {Standard} vs {Classic - Formerly Standard}

If the leg set and base frame looks like the left image below, it is our **{Standard}** leg set. If the leg set and base frame looks like the right image below, it is our **{Classic}** leg set.

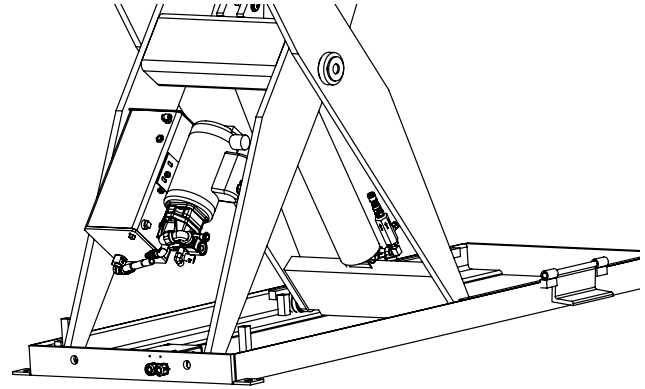


1.4.2 Hydraulic Power Units {Standard} vs {Classic - Formerly Standard}

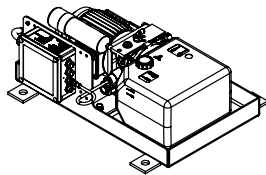
If the motor looks like the left images below it is our **{Standard}** HPU. If the motor looks like the right images below, it is our **{Classic}** HPU.



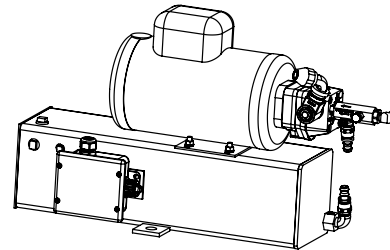
INTERNAL HPU
{STANDARD}



INTERNAL HPU
{CLASSIC - FORMERLY STANDARD}



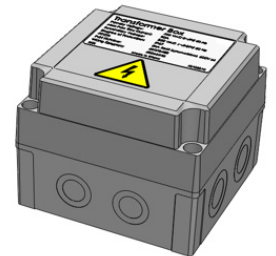
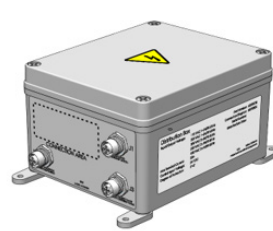
EXTERNAL HPU
{STANDARD}



EXTERNAL HPU
{CLASSIC - FORMERLY STANDARD}

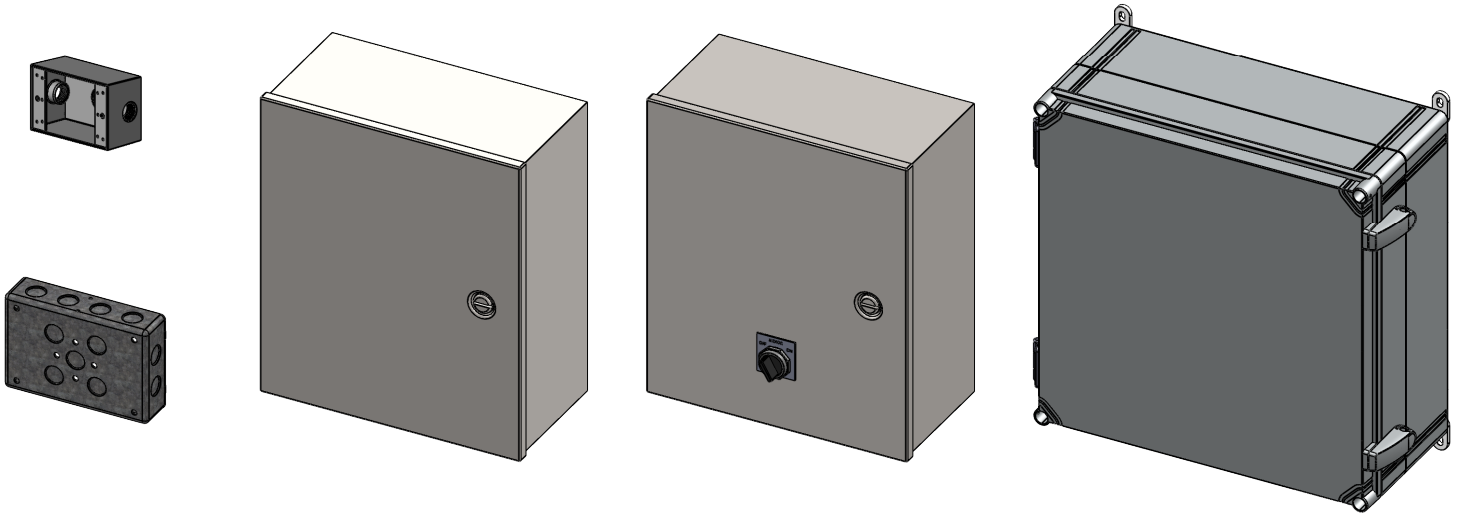
1.4.3 Controls {Standard}

If the control box is integrated at the HPU and includes M12 connectors on the outside of the box as in the 4 left most images below, and/or if the transformer box for 460/3/60 only looks like the right most image below, it is our **{Standard}** controls.



1.4.4 Controls {Classic - Formerly Standard}

If a controls box integrated at the HPU or found at the end of the base frame does not include M12 connectors on the outside of the box, and/or you see shipped loose control panels similar to the 3 images below to the right, it is our **{Classic}** controls.



1.5 Additional Resources

Information regarding industrial ergonomic education may be found by scanning the QR code below. If you have a question or comment on this model, you will have access to contact us there.



Ergonomic Info & Checklists

2 SAFETY

All personnel installing, operating, and maintaining this machine shall read and understand this manual. For questions or concerns contact the manufacturer.

This machine shall be installed, operated, and maintained by trained and/or qualified personnel only.

2.1 Safety Alert Symbols



A symbol that indicates a hazard. It is composed of an equilateral triangle surrounding an exclamation mark. The safety alert symbol is only used on hazard alerting signs. It is not used on safety notice and safety instructions signs.

A – For use with **DANGER** signal word; (safety white triangle, safety red exclamation mark, safety red background)

B – For use with **WARNING** signal word; (safety black triangle, safety orange exclamation mark)

C – For use with **CAUTION** signal word; (safety black triangle, safety yellow exclamation mark)

D – For use with **DANGER, WARNING, or CAUTION** signal words; (**D** is a safety yellow triangle with a safety black border and safety black exclamation mark;

2.2 Signal Words



DANGER Indicates a hazardous situation that, if not avoided, will result in death or serious injury.



WARNING Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



CAUTION Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.



NOTICE Indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

2.3 Maintenance Device(s)

Any time it is necessary to maintain or repair this machine and the platform is required to be in a raised position, the maintenance device(s) shall be engaged. The maintenance device(s) will be referenced several times throughout this manual and its(their) use should be thoroughly understood before working on this machine. See **Engaging Maintenance Device(s)** in the **Maintenance & Repair** section.

2.4 Emergency Stop Control Button (Option)

Typical press and hold (standard) controls which require the UP or DOWN pushbuttons or foot pedals to be pressed and held to raise or lower the platform do not require an Emergency Stop pushbutton as the lift stops raising or lowering when the pushbuttons/foot pedals are released. However, when press and release (maintained contact) controls are used, an E-Stop pushbutton control shall be provided. The E-Stop pushbutton is engaged to stop platform movement at any position, regardless of whether or not an emergency situation is at hand.

2.5 Velocity Fuse (Option)

Hydraulic lift tables that are actuated by single acting hydraulic cylinders are power up, gravity down. A hydraulic pump forces oil into the cylinder to raise the lift and a solenoid opens a valve allowing the oil to return to the reservoir thus lowering the lift. Any time a lift is raised, it is being supported by a column of oil.

If any part of the hydraulic piping system is compromised (hose or fitting leaks), the platform will descend. Velocity Fuses (VF) resist this descent. Though they are optional for all lift tables, they are usually recommended for any lift tables that will have personnel on them. There is one or more installed as required at the cylinders. They are a fluid flow, velocity sensitive check valve. In the case of a catastrophic piping failure, where the oil rushes out of the cylinder, the VF snaps shut automatically stopping further flow instantly and completely. The VF locks the oil in the cylinder immediately stopping lift descent. The VF will remain closed until the pressure is equalized. The only way to open the VF is to pump oil into the cylinder. Once reopened, the VF is ready again for service. Contact Customer Service for assistance.

Because the usual way to unlock a VF is to reverse the oil flow, we require that any lift that has a VF specified be stopped at its upper travel by a limit switch. The upper travel limit switch is set at the factory to stop upward movement just before the lower rollers hit the hard stops to prevent had stop related lock up. Whenever a VF does lock up, contact customer service for assistance.

Another option for velocity protection is the Excess Flow Protector (EFP - see next section). Although they allow the lift to descend very slowly, they eliminate the necessity of an upper travel limit switch.

2.6 Excess Flow Protector (Option)

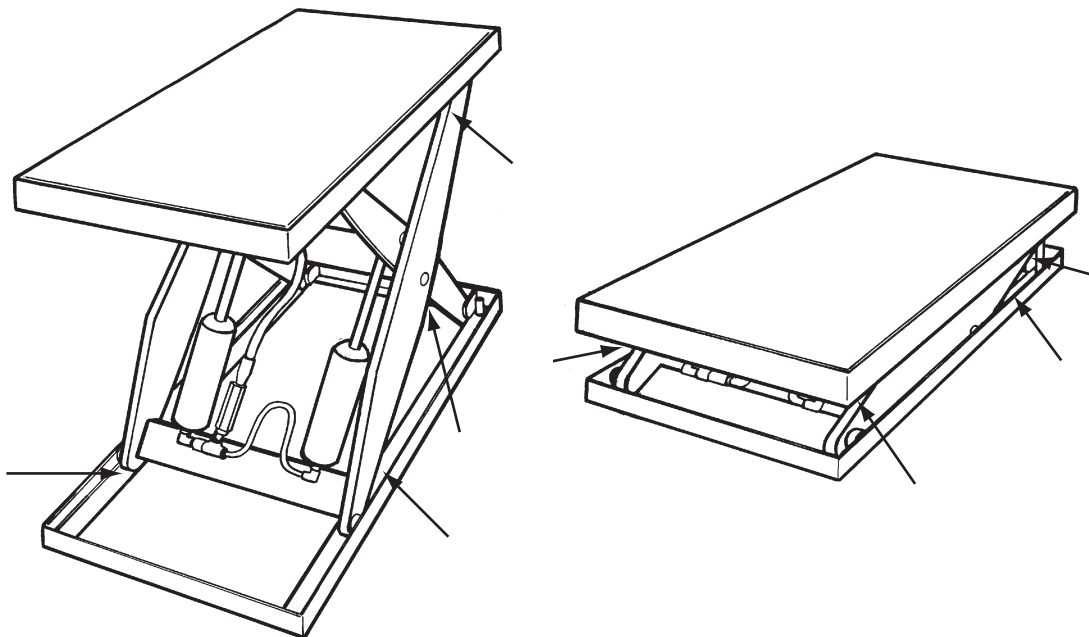
An Excess Flow Protector (EFP) is another style of velocity protection device. These valves function much like a VF. They are just as sensitive to rapid velocity changes and they snap shut, but they allow oil to bleed past at a lower rate after snapping shut, allowing the lift to descend slowly.

VFs and EFPs are sensitive to any instantaneous change in oil velocity, such as surges caused from air bubbles in the oil. They are also sensitive to other things like viscosity and dirt. If oil thickens or dirt gets into the system, these devices could snap shut. Engineering selects a VF or an EFP to give the best combination of lift performance and protection, but sometimes these devices will shut off the lift when it is not wanted. This usually can be overcome by adjusting the flow control for a slightly slower down speed. Sometimes at installation air in the system must be worked out to stop the unwanted shut off of a VF or an EFP. As mentioned before, dirt can affect the operation of these devices and they may require removal and cleaning.

2.7 Down Speed Flow Control Valve

Down speed flow control valves are either adjustable or not adjustable. The adjustable down speed flow control valve is a feature that allows you to adjust the lowering speed. At the factory, it is set to be no more than twice the rise speed. Both types of valves also prevent the platform from lowering too quickly in the event of a ruptured pressure hose or fitting. If a hose were to ever be severed, the platform will lower at the same rate it normally does. When a velocity fuse or excess flow protector valve has been added, the location of the down speed flow control valve will be changed from the base of the cylinder(s) to the HPU. See **Adjusting Down Speed Flow Control Valve** in the **Maintenance & Repair** section.

2.8 Pinch Point Identification


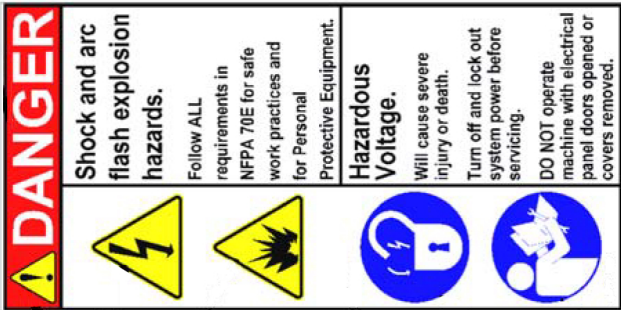





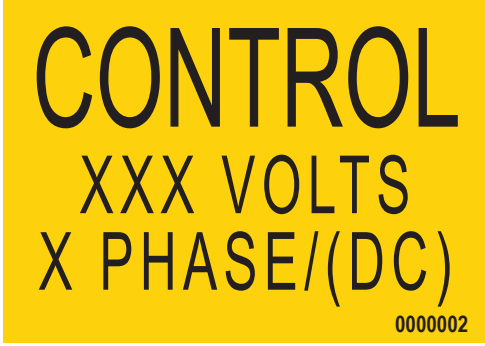
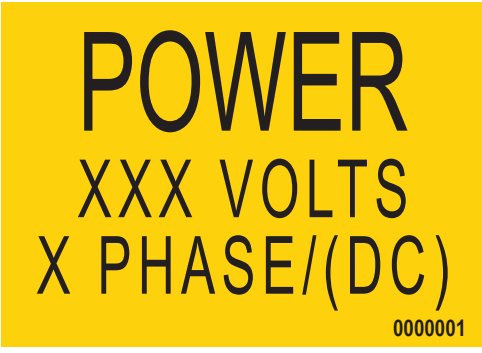


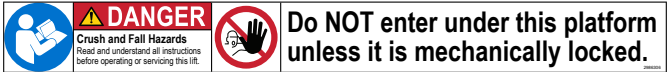

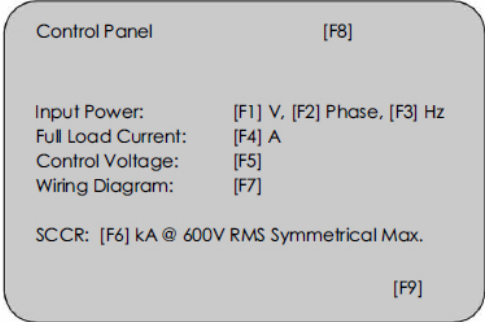
3 LABELING

This machine has labeling to indicate potential hazards this machine may pose when operating and/or maintaining the machine. All labels must be legible. If any label is missing, damaged, or otherwise illegible contact the manufacturer for replacement labels.

3.1 Label Part Numbers, Images and Location

Item No.	Qty	U/M	Descriptions for Lift Table Labels	Part No.
1	2	Ea	LD DCL 2.00X3.00 SOUTHWORTH SERIAL ID BL	10079929
2	1	Ea	BK-LD DCL 3.00X1.50 ARC FLASH AND SHOCK	10047672
3	4	Ea	BK-LD DCL 2.00X3.00 FOR MAINTENANCE ONLY	2991927
4	1	Ea	LD DCL 1.50X5.50 TANK TO BE FULL ONLY	2986997
5	2	Ea	BK-LD TAG 2.00X10.00 SOUTHWORTH	5900158
6	1	Ea	BK-LD DCL 2.00X4.50 NOTICE! DO NOT RAISE	2921026
7	1	Ea	LD DCL 2.50X5.00 PROPER INSTALLATION IS	2998365
8	1	Ea	BK-LD DCL 2.50X12.75 (ENGLISH AND SPANIS	10021381
9	1	Ea	LD DCL 2.00X8.00 DON NOT OPERATE WITHOUT	10086440
10	1	Ea	LD DCL 1.25X1.75 CONTROL	CONTROL
11	1	Ea	BK-LD DCL 1.25X1.75 POWER	POWER
12	4	Ea	LD DCL 1.25X2.75 CAPACITY	CAPACITY
13	2	Ea	BK-LD DCL 2.00X12.00 A DANGER	5904643
14	4	Ea	BK-LD DCL 2.00X17.00 TO AVOID BODILY INJ	2986306
15	1	Ea	LD WARNING CANCER AND REPRODUCTIVE	10095524
16	1	Ea	LD DCL 2.00X3.00 NEC TEMPLATE	10106861

<p>1</p>	<p>Located on strongbacks and beneath platforms on both sides</p> <div data-bbox="215 210 691 527"> <p>Southworth Products PO Box 1380 Portland, ME 04104-1380</p>  <p>Model No: Serial No: www.SouthworthProducts.com Sales, Parts and Service 800-743-1000 or 207-878-0700</p> <p>10079929</p> </div>	<p>2</p>	<p>Located on control and transformer boxes</p> <div data-bbox="841 220 1461 527">  <p>10047672</p> </div>
<p>3</p>	<p>Located on maintenance device(s)</p>	<p>4</p>	<p>Located on HPU reservoir only</p>
<div data-bbox="118 716 786 961"> <p>FOR MAINTENANCE ONLY</p> <p>2991927</p> </div>		<div data-bbox="836 747 1500 930"> <p>TANK TO BE FULL ONLY WHEN CYLINDER IS COLLAPSED</p> <p>THIS MACHINE USES CITGO AW 32 HYDRAULIC FLUID OR EQUIVALENT</p> <p>2986997</p> </div>	
<p>5</p>	<p>Located on platform skirts</p>	<p>6</p>	<p>Located on base frame</p>
<div data-bbox="118 1236 786 1371">  <p>5900158</p> </div>		<div data-bbox="836 1155 1500 1434"> <p>NOTICE</p> <p>Do not raise to full upper physical stops. Upper travel limit switch must be connected and properly adjusted to prevent structural damage.</p> <p>2921026</p> </div>	
<p>7</p>	<p>Located on flow control valve</p>	<p>8</p>	<p>Locate on 115v primary voltage power cords only, 1" away from the plug</p>
<div data-bbox="118 1602 786 1921"> <p>NOTICE</p> <p>Proper installation is essential to the performance of this product. Leveling and securing the base frame along with other important information is within your owner's manual. If the owner's manual is not available, log on to the company's website to download a free copy.</p> <p>2998365</p> </div>		<div data-bbox="836 1690 1500 1822">  <p>*SAFETY WHITE SELF-ADHESIVE VINYL</p> </div>	

9	Located on mid section of handrails for personnel lifts only	10	Located on control box
			
11	Located on control and transfer boxes (Provide SN to Cust. Serv. for Part #)	12	Located on ends of platform skirts (Provide SN to Cust. Serv. for Part #)
			
13	Located on both sides of platform skirts Cut off last image panel for personnel lifts	14	Located on both ends of platform skirts
			
15	Located on side of platform skirt	16	Located on control box {Standard} (Provide SN to Cust. Serv. for Part #)
			

4 INSTALLATION

Before Installation read and understand this manual. **Only trained and qualified personnel shall install this machine.** Remove all packaging and inspect the machine for damage and/or missing components. Contact the manufacturer if damage is found or components are missing.

Confirm house power matches the primary power indicated on the lift table and on the order documents and review the **Electrical Functional Description (EFD)** (supplied separately) and/or the electrical schematic, with **Electrical** and **Appendix** sections to determine how to wire.

The owner/ installer is responsible for ensuring all codes and ordinances are met and any necessary permits are obtained prior to installation.

Use proper Personal Protective Equipment when installing this machine.

DANGER

Disconnect and/or lock out the electrical supply to the machine prior to any installation or maintenance being performed.

Electric motors can create sparking, do not install in an area where flammable materials are present.

Do not enter beneath the platform.

Personnel are not permitted on the platform unless ANSI MH29.1 compliant personnel guarding is provided. Guarding must be installed and operational before use including all handrails, personnel gates & equipment gates.

All emergency stop devices shall clearly identify to which machine they belong.

Do not change the hydraulic power unit relief valve setting. It has been set at the factory for the lift table and should not require any adjustment.

This machine must be located and operated indoors and in an area protected from rain and moisture, unless specifically designed to do so.

A substantial number of feature and function combinations exist when custom equipment is provided by a manufacturer. Images illustrated throughout this manual are only representative samples of designs that may or may not exist in the machine this general manual was provided for. When questioning whether any part of this manual applies specifically to your machine, you may contact customer service with your order number and/or the serial number for your machine, and we will provide the specific drawing(s) that combined with this manual will provide sufficient information to install, test, operate and maintain the equipment.

⋮ This machine must be located and operated on a solid, level surface capable of supporting the machine and its maximum rated capacity.

⋮ Fork trucks or other lifting devices used for moving this machine must be capable of lifting the maximum weight provided in the shipping documents.

⋮ Wiring schematics, diagrams, arrangements, and specifications can be found in the Electrical and Appendix sections.

NOTICE

⋮ Hydraulic schematics, arrangements, and specifications can be found in the Hydraulics section.

4.1 Machine Inspection

Remove the shipping material and unskid the lift. Inspect the shipping materials and machine for damage. Do not continue if damage is found. Contact customer service for assistance if damage is discovered.

NOTICE

⋮ There should be an electrical functional diagram (EFD) or an electrical schematic inserted into the control box of this machine. For internal hydraulic power units, it will be necessary to engage the maintenance device(s) before retrieving this document from the control box. See General Machine Installation and/or Manually Raising Platform sections. Contact customer service if not found.

On the front of this manual and on the EFD or electrical schematic, write down the model number, serial number, and date the lift is placed in service. If this information is not available initially, you can find the model number and serial number on the serial number plate on the machine. Once the maintenance device(s) has(have) been engaged, the serial number plate will be accessible to view on the cross member the cylinder(s) rest(s) on.

4.2 Positioning the Lift Table (Without Lifting Eyes)

1. Using a fork lift with straps, raise the machine off the shipping skid and move it to the install location. Position the machine in its appropriate orientation for operation.

⚠ CAUTION

⋮ When moving the lift, do not ever attempt to pick it up by the platform. The lift should be picked up by the base frame only. The use of a strap sling is suggested.

⋮ Approximate machine weight: Review shipping documents to determine weight.

2. Get familiar with the key components of this lift table on the following pages before continuing on with the installation.

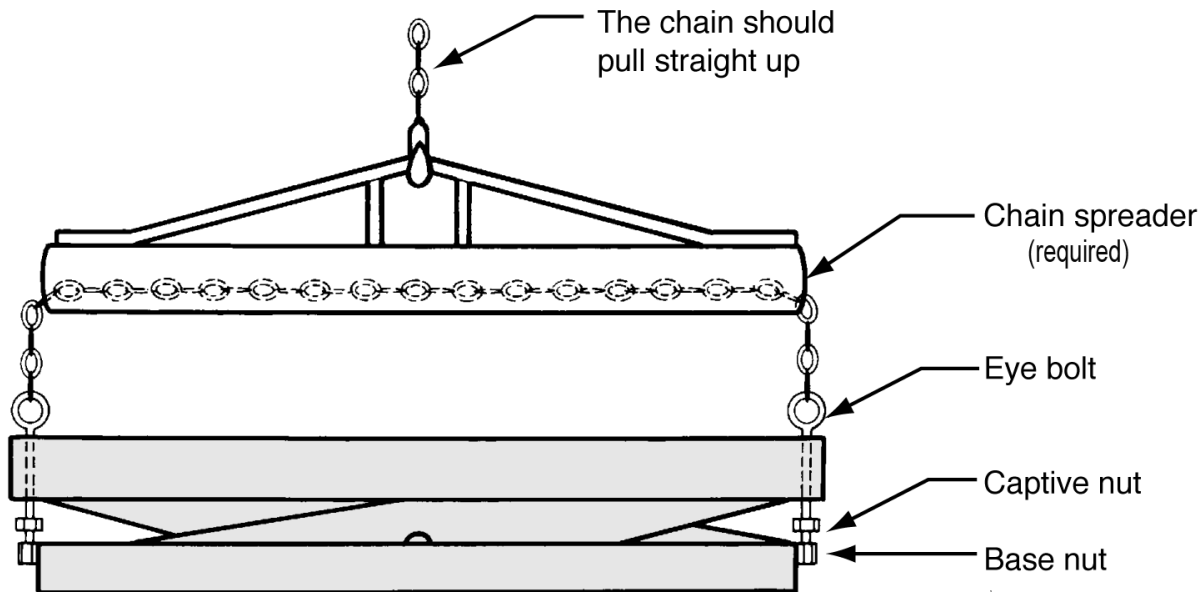
4.3 Positioning the Lift Table (With Lifting Eyes)

1. Using a chain spreader and the lift table lifting eyes, raise the machine off the shipping skid and move it to the install location. Position the machine as necessary.

NOTICE

Approximate machine weight: Review shipping documents to determine weight.

There are different configurations of lifting eyes but always pull straight up. Lifting eyes are to be hand tightened only.



2. Get familiar with the key components of this lift table on the following pages before continuing on with the installation.

CAUTION

Lifting eyes may be used on the platform to position the machine but must be removed before operating the machine or the machine may be damaged.

The lifting eye package typically provides four (4) holes in the lift table platform. Two holes are for connecting the lifting eyes through the platform and threading into the base frame weldments to lift the entire machine. The other two holes are for threading the lifting eyes into the platform only in case it needs to be raised manually without using power.

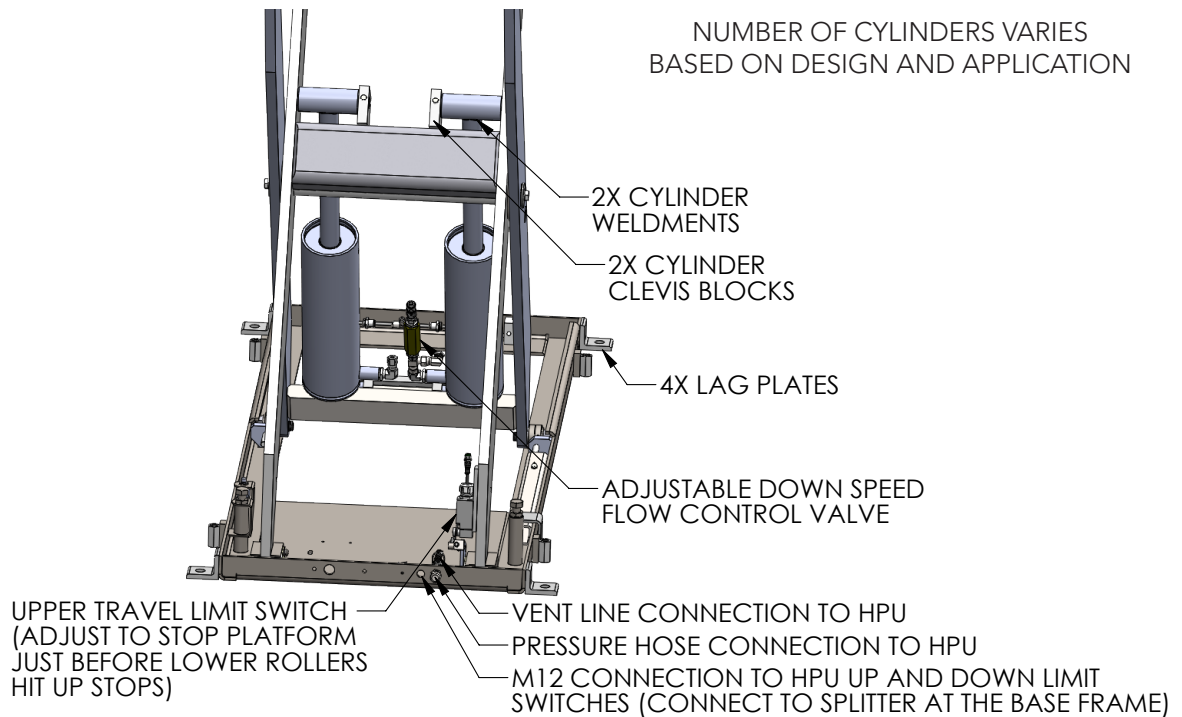
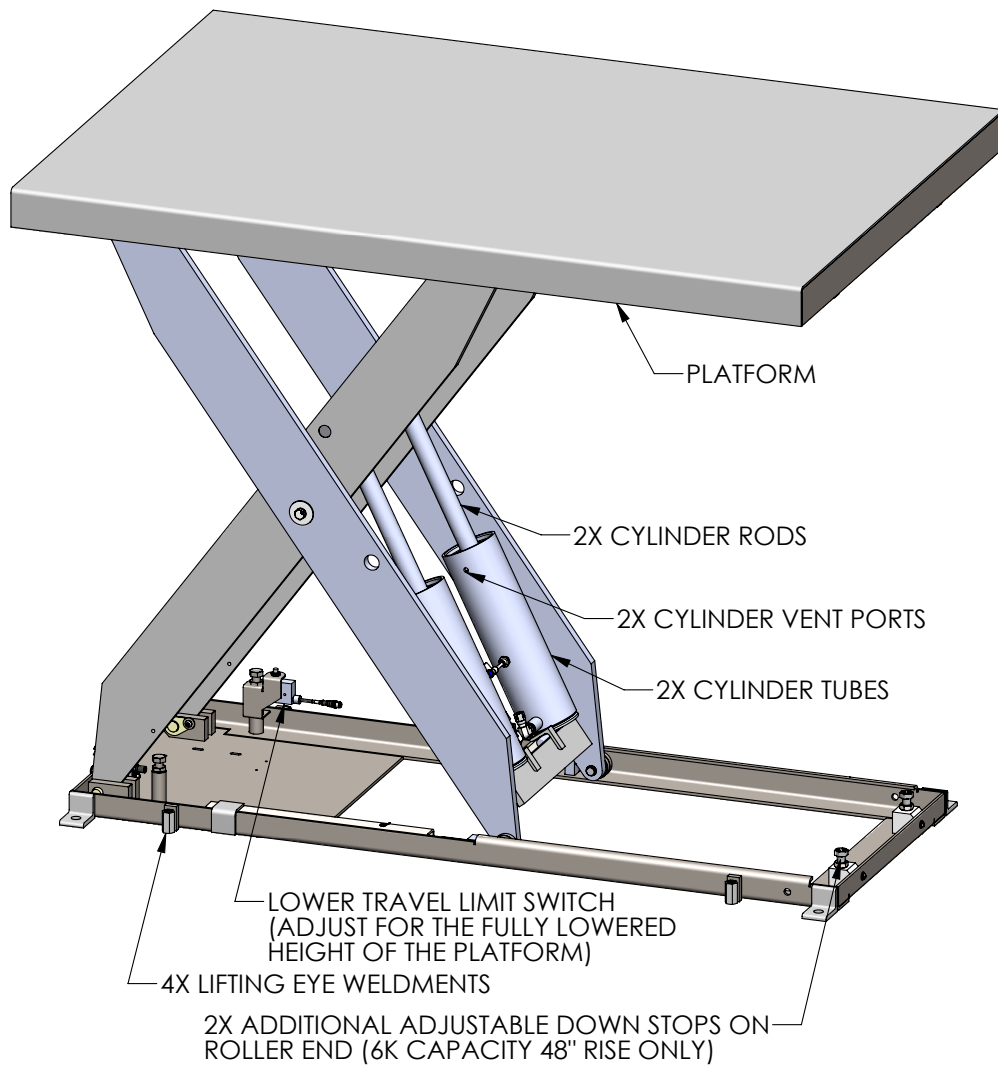
CAUTION

Do not install this machine in a pit unless the machine has been designed for such installation. Shear points exist as the platform passes the edge of the pit wall and can cause severe injury. See ANSI MH29.1-2020, Section 4.11.1. Contact Southworth Customer Service with your serial number if you have any questions.

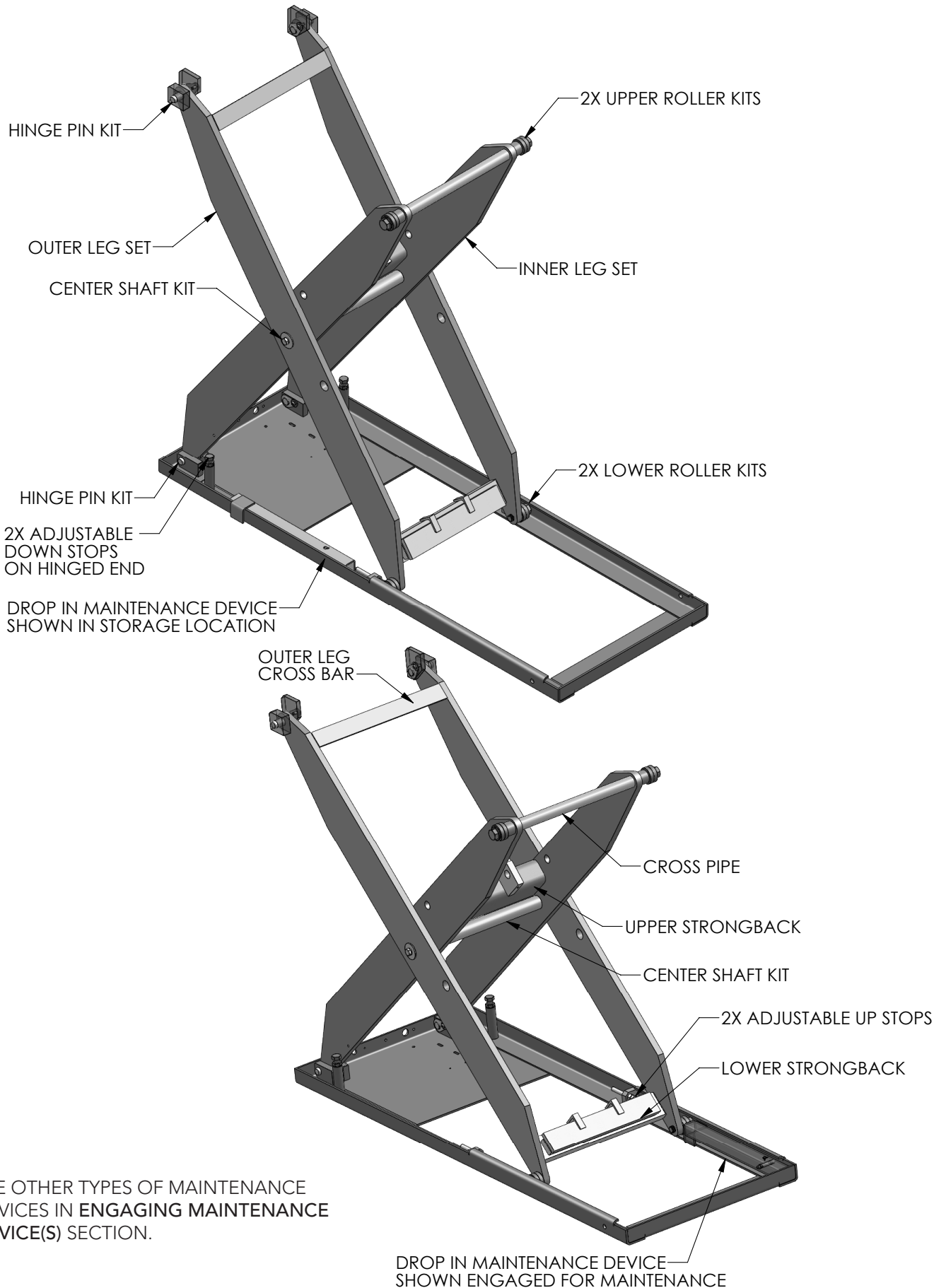
All required guarding must be in place before operation.

1. Verify that the pit dimensions match the pit plan. Pit plans for specific machines may be obtained by contacting the manufacturer and/or the dealer from which this machine was purchased. They are typically supplied during the sales process and approved/confirmed during the production process.
2. Verify that pit is clear of tools and other debris before lowering the machine into the pit.
3. Use a crane or hoist to lift the machine off the shipping skid.
4. Carefully lower the machine into the pit. The machine must be centered in the pit with no more than a one inch gap between the platform and the pit wall. (ANSI MH29.1-2012 §4.11.1). Do not drop the machine into the pit.

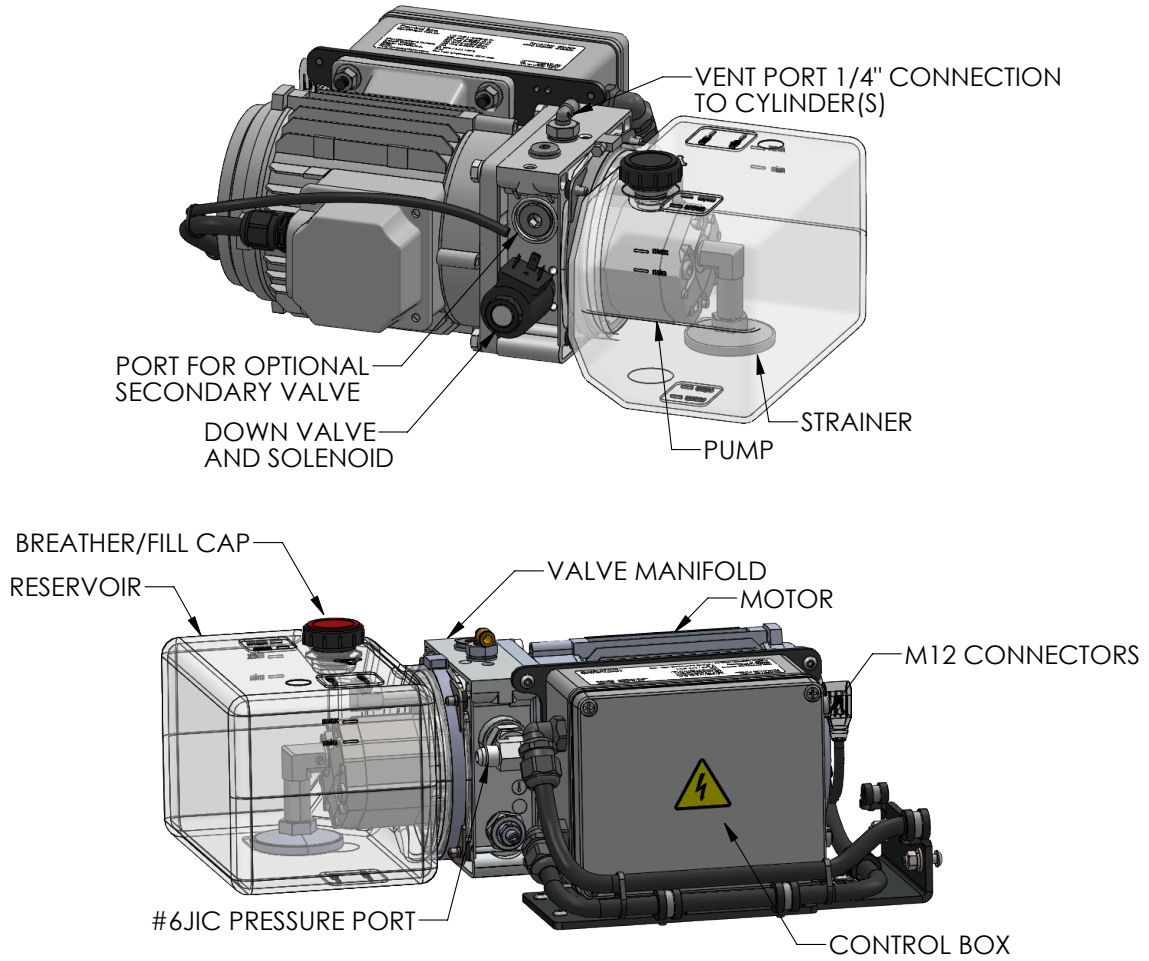
4.5 Key Components - Including Non-Standard Options



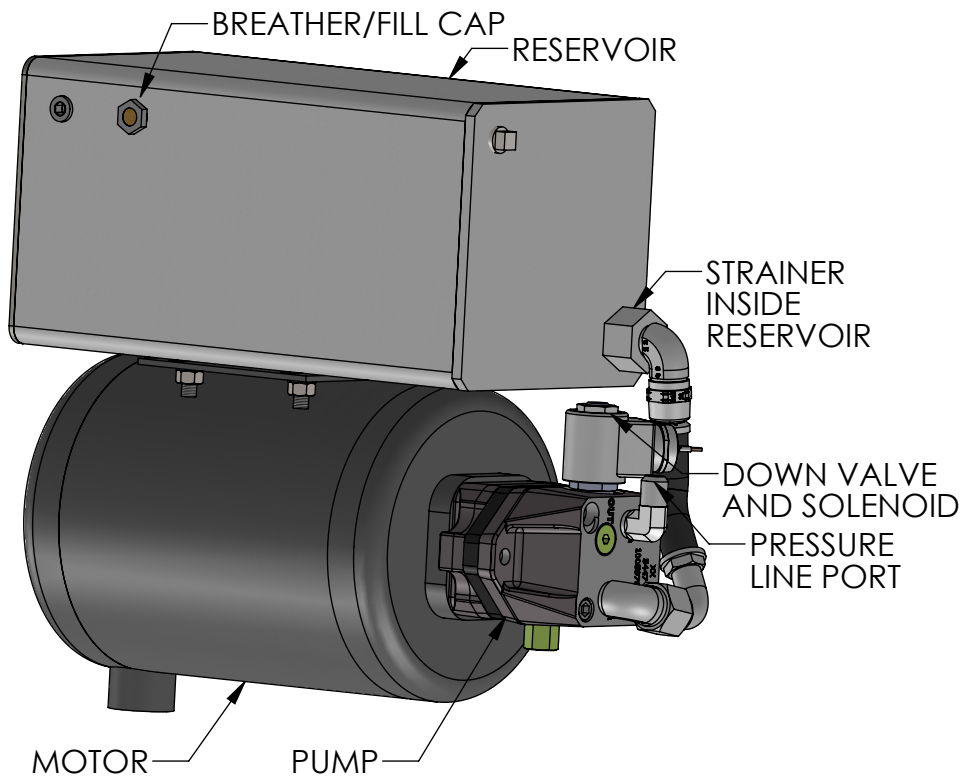
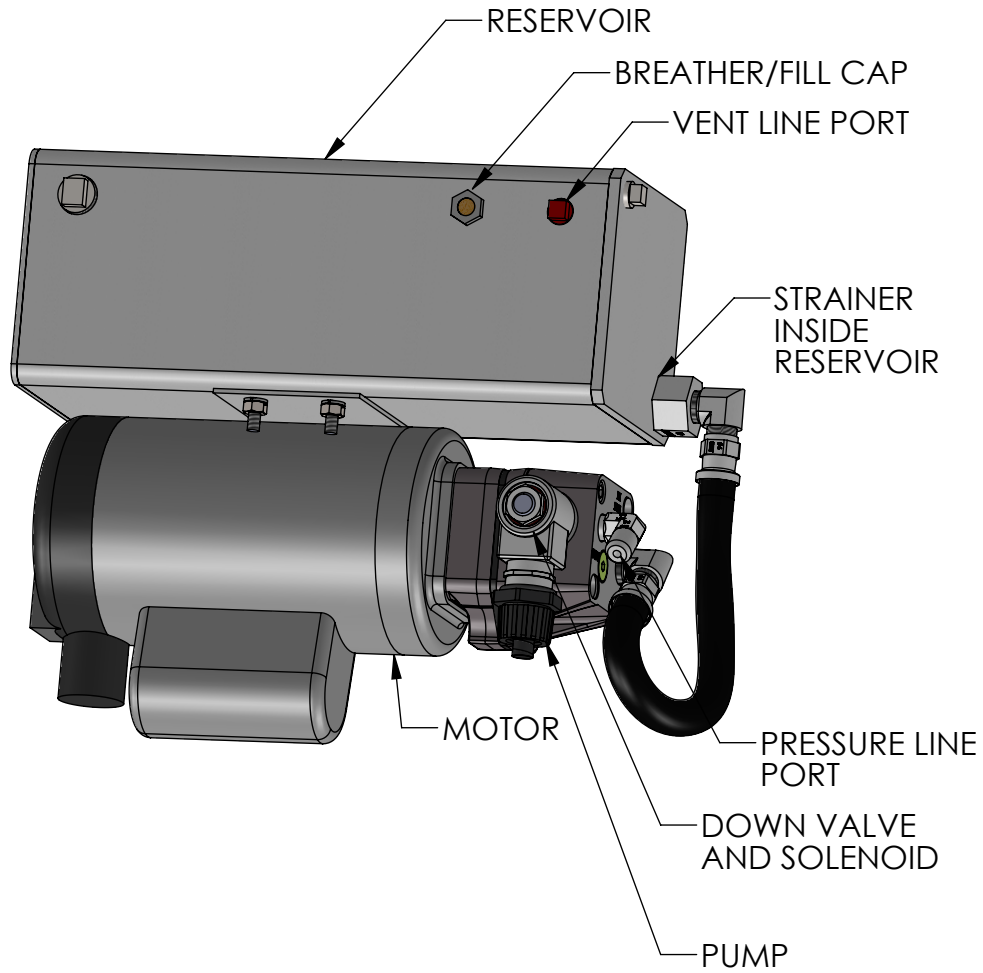
4.6 Key Components - Standard Features



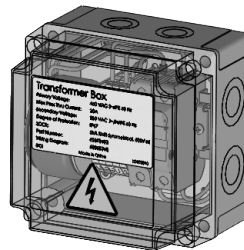
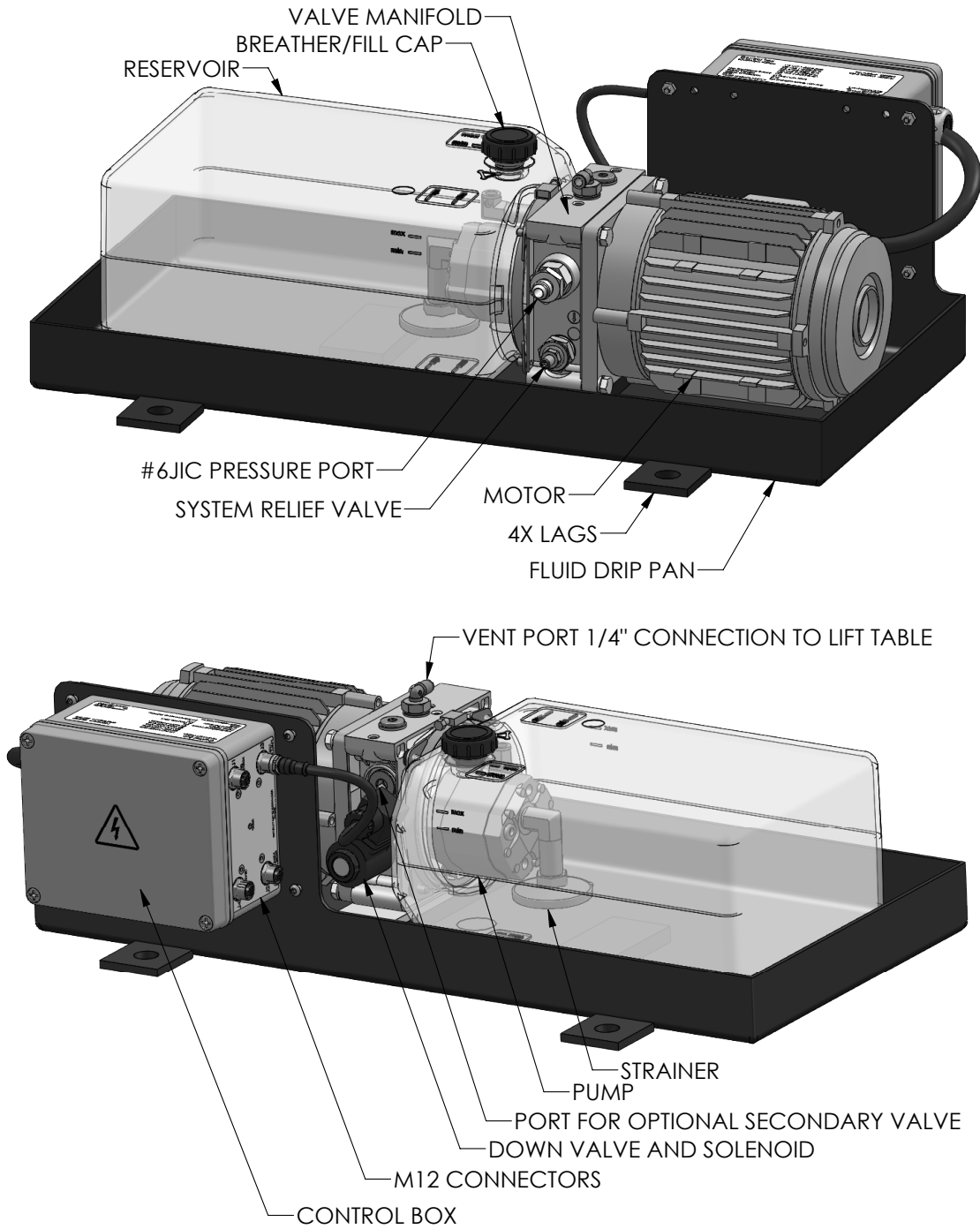
4.7 Key Components - Typical Internal Hydraulic Power Unit {Standard}



4.8 Key Components - Typical Internal Hydraulic Power Units {Classic}

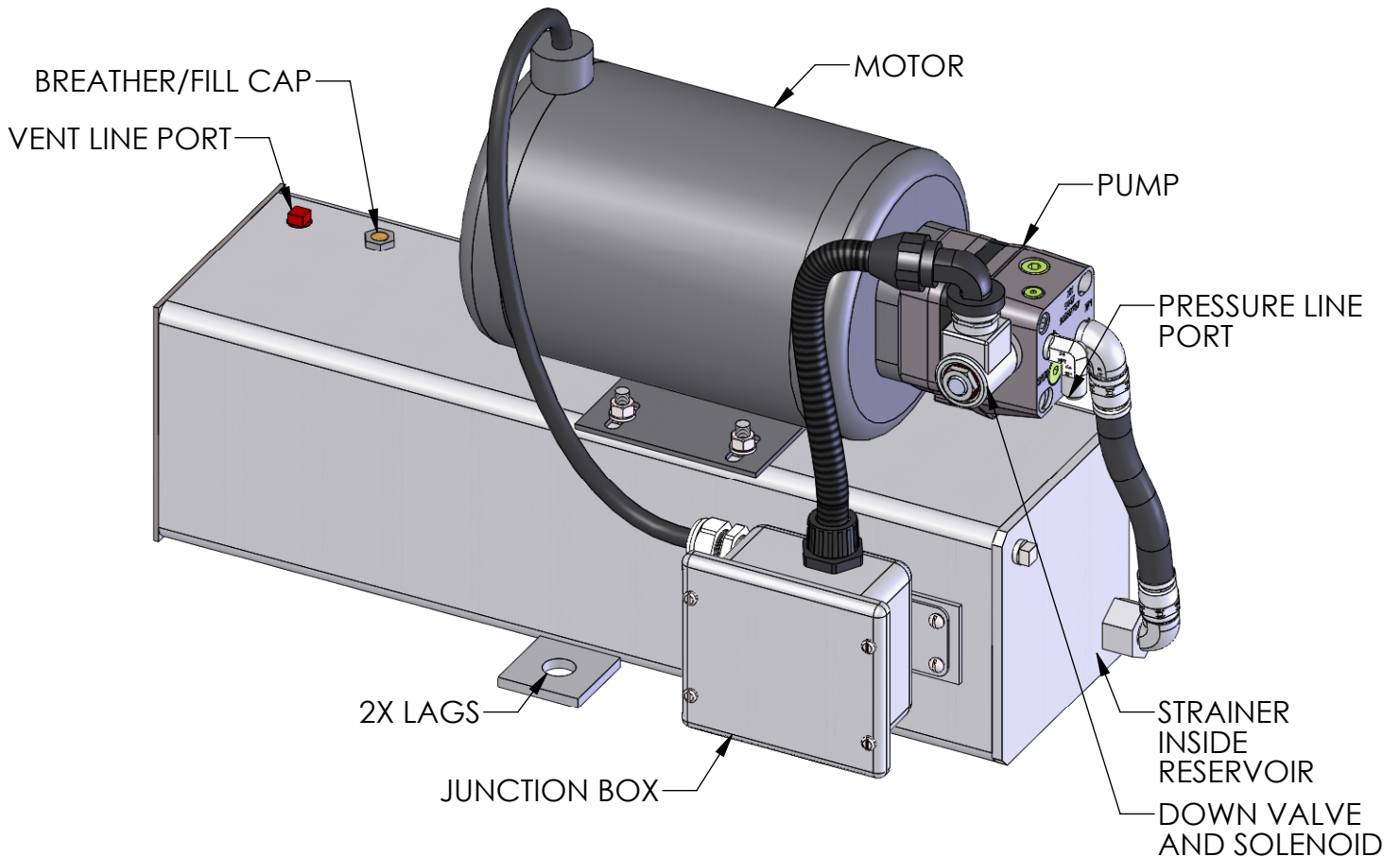
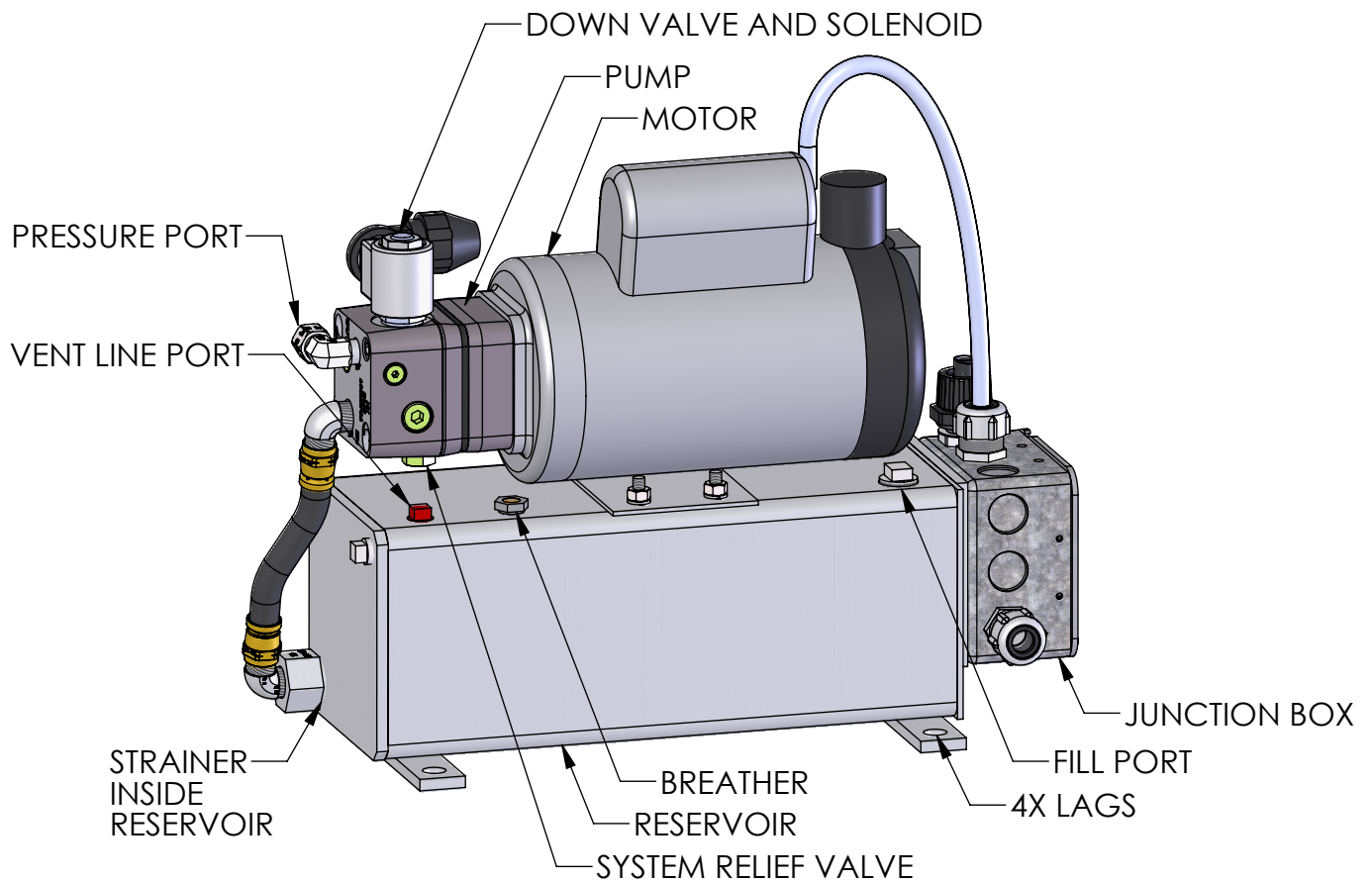


4.9 Key Components - Typical External Hydraulic Power Units {Standard}

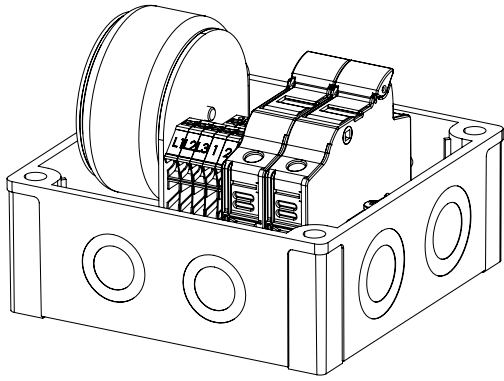


3-PHASE TRANSFORMER SHIPPED LOOSE
(REQUIRED FOR 460/3/60 PRIMARY POWER ONLY)

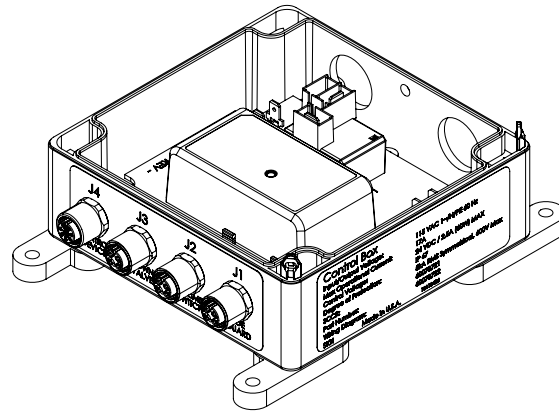
4.10 Key Components - Typical External Hydraulic Power Units {Classic}



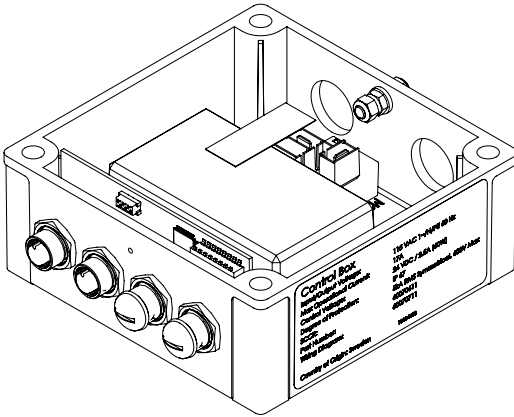
4.11 Key Components - Typical Control Boxes {Standard}



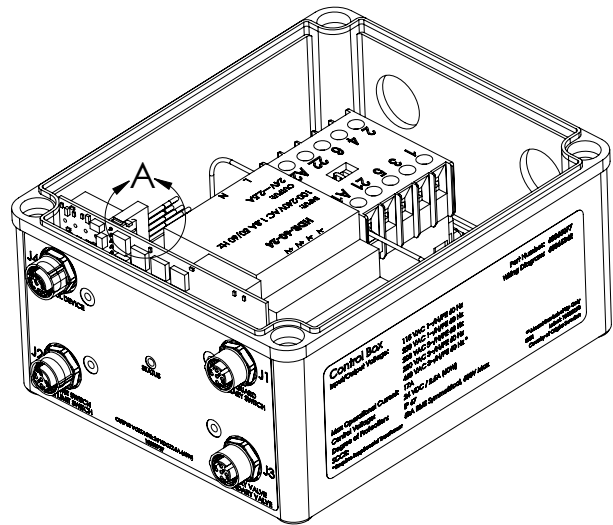
TRANSFORMER BOX



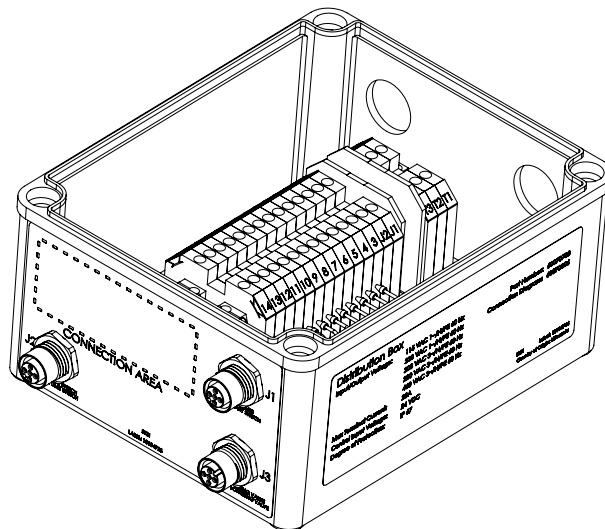
CONTROL RELAY BOX



COMPACT CONTROL BOX

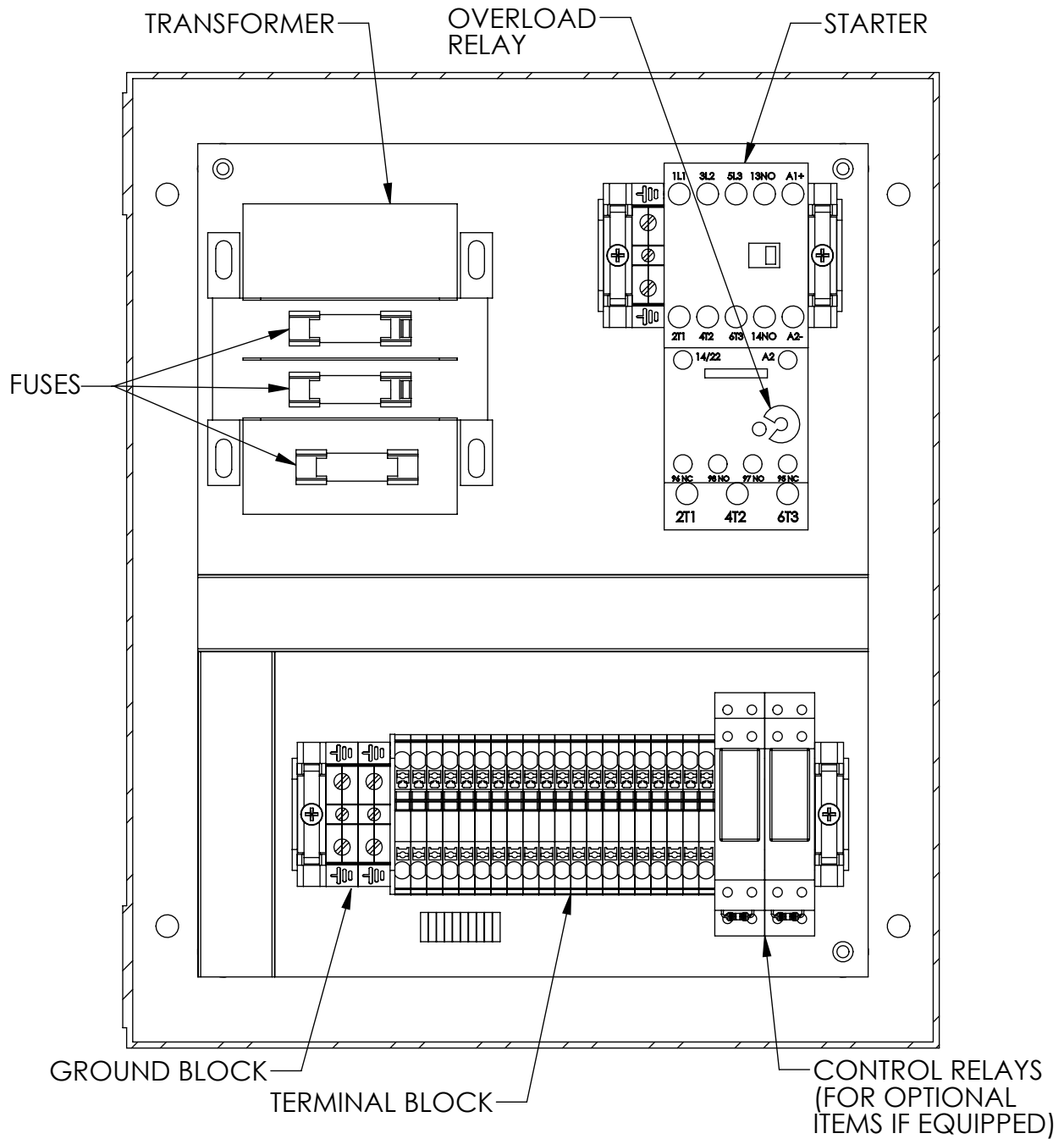


STANDARD CONTROL BOX



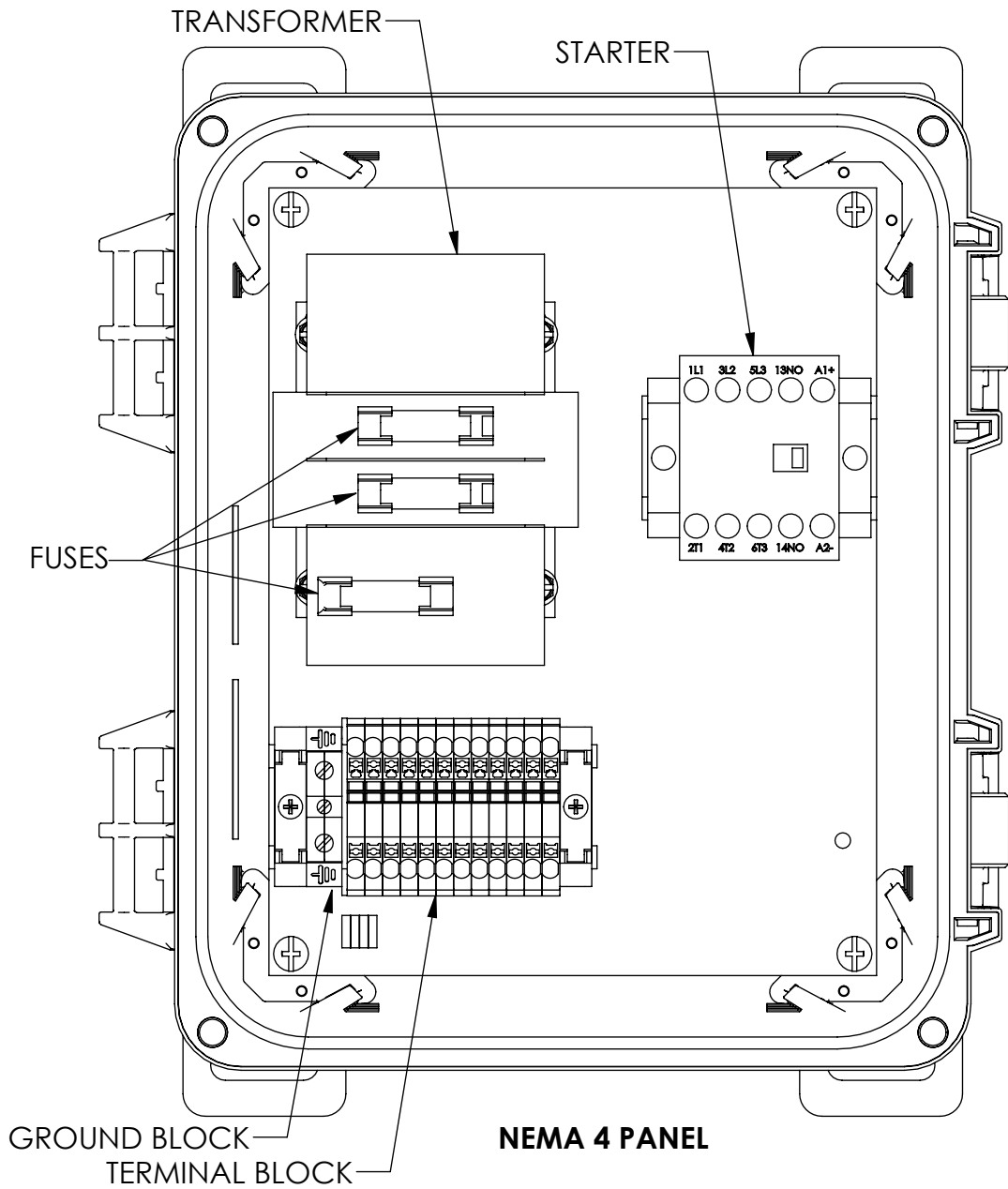
DISTRIBUTION BOX

4.12 Key Components - Typical Control Panels {Classic}



NEMA 1 PANEL

NOTE: LIFT TABLES MAY BE EQUIPPED WITH EITHER OVERLOAD RELAY OR INTERNAL MOTOR THERMAL PROTECTION



NOTE: LIFT TABLES MAY BE EQUIPPED WITH EITHER OVERLOAD RELAY OR INTERNAL MOTOR THERMAL PROTECTION

4.13 General Machine Installation

A lift table may be shipped with an internal or an external hydraulic power unit and a transformer box for standard machines (shipped loose for units ordered with primary power of 460/3/60 only) or a control panel for classic machines (shipped loose for units ordered with any primary power). Keep any components as close to the location of the machine as practical.

For internal power units, a 10-foot cord with plug is provided for 1 HP 115/1/60 primary power. Depending on the design, temporary pigtailed come supplied for other primary power options. Apply the proper primary power to the motor leads of this temporary pigtail coming out of the junction box at the base of the lift table to raise the platform to get the maintenance device(s) installed so permanent wiring may be installed. Temporary pigtail leads are also provided to allow connection of control power voltage to the down valve in order to lower the lift onto the maintenance device(s) once the lift is raised.

Note that though temporary pigtailed may be provided for initial installation convenience, they need to be replaced with cords/conduits appropriate for the electrical codes that apply for the application and jurisdiction. Terminations to be done in the junction box at the base of the lift table.

For external power units, a 10-foot cord with plug is provided for 1 HP 115/1/60 primary power. A 5-foot hose kit is typically provided for hydraulic connection between the lift table and the HPU.

Review the **Electrical Functional Description** (EFD) section and **Wiring Diagram Index** sections for **{Standard}** controls or the **Electrical Schematic** section for **{Classic}** controls before installation as they outline the operating features, characteristics and electrical connections of a particular lift table. Contact Customer Service with the order and/or serial number of your lift table if it has special controls not otherwise illustrated in this general manual.

A fused or otherwise code approved disconnect is required. The special transformer box (supplied with **{Standard}** lift tables when ordered with 460/3/60 primary power) must be used for 460/3/60 primary power lift tables. A control panel (supplied with **{Classic}** lift tables or provided by others) must be used when ordered with any other voltage than 1 HP 115/1/60 primary and control power. See **Hydraulic** and **Electrical** sections for more information.

1. Mount the transformer box (if included - supplied with **{Standard}** lift tables ordered with 460/3/60 primary power only) in the desired location or mount the control panel (if included - supplied with **{Classic}** lift tables ordered with any other primary and control power than 115/1/60).
2. Ensure lift table lifting eyes (if included) are removed and stored for future use.

For external HPU machines only

3. Position and lag down the HPU.
4. Complete pressure hose and vent line hydraulic connections between the lift table and the HPU. See **Key Components** and **Hydraulic Schematics** sections for terminations of connections.
5. Complete electrical connections (including signals, limit switches etc. if equipped) between the lift table and the HPU control box with supplied cable **{Standard}** or between the lift table, control panel, and the HPU junction box with end user provided wiring **{Classic}**. See **Key Components** section to locate terminations for connections.

6. Connect the handheld pushbutton controls to the HPU control box **{Standard}** or to the control panel **{Classic}**.

For 460/3/60 {Standard} machines only

7. Complete electrical connections between the transformer box and the HPU control box.
8. Complete electrical connections between the house power fused disconnect and the special transformer box.

For {Classic} machines with different primary power and control voltages

9. Complete electrical connections between the base frame junction box (if electrical control features are included in the lift table) and the control panel.
10. Complete electrical connections between the HPU junction box and the control panel.
11. Complete electrical connections between the house power fused disconnect and the control panel.

For all other {Standard} primary power voltage machines without 115/1/60 plug

12. Complete electrical connections between the house power fused disconnect and the HPU control box.

For internal HPU machines only with 115/1/60 plug

13. Plug power cord into a 115v outlet on a dedicated 20 amp circuit.

For all machines

NOTICE

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To avoid damage to the machine on initial start-up, confirm that the upper and lower rollers are seated in their respective tracks, that the platform or leg set is not ajar, and that the maintenance device(s) is(are) in its(their) respective storage location(s).

14. Confirm that the upper and lower rollers are actually seated in their respective tracks.
15. Ensure that the maintenance device(s) is(are) in its(their) respective storage location(s) and not deployed.
16. Power up the machine.

For Maintained Contact (Press and Release) controls only (Optional)

17. Press and release the UP ARROW pushbutton on the controls. Ensure that the motor stops when fully raised and up limit switch activated. Press the ESTOP pushbutton if the upper travel limit switch does not shut off the motor when the platform is fully raised. See **Adjusting Limit Switches and Hard Stops** or **Adjusting Limit or Proximity Switches sections** for more information.
18. After the platform has reached fully raised height, insert the maintenance device(s). See **Engaging Maintenance Device(s)** section for more detail.
19. Using the DOWN ARROW pushbutton, lower the lift table so that the rollers rest against the maintenance device(s). Wait about 5 seconds after the rollers have engaged the maintenance device(s), then push the ESTOP pushbutton.

NOTICE

⋮
⋮ **If the lift table includes double acting cylinders that power the lift table down, do not continue holding the DOWN ARROW pushbutton for 5 seconds, as this will not result in relieving the hydraulic pressure but serve to power into the maintenance device(s), which could result in damaging the machine.**
⋮
⋮

For Standard (Press and Hold) controls only (without upper limit switches)

20. Press and hold the UP ARROW pushbutton on the controls. Ensure that the motor stops when fully raised after releasing the pushbutton. Avoid powering into the up stops.
21. After the platform has reached fully raised height, insert the maintenance device(s). See **Engaging Maintenance Device(s)** section for more detail..
22. Using the DOWN ARROW pushbutton, lower the lift table so that the rollers rest against the maintenance device(s). Wait about 5 seconds after the rollers have engaged the maintenance device(s), then release the pushbutton.

NOTICE

⋮
⋮ **If the lift table includes double acting cylinders that power the lift table down, do not continue holding the DOWN ARROW pushbutton for 5 seconds, as this will not result in relieving the hydraulic pressure but serve to power into the maintenance device(s), which could result in damaging the machine.**
⋮
⋮

For all machines

23. Lockout/Tagout house power.
24. Level the machine. Use steel shims under the base frame and lag plates as necessary.

NOTICE

⋮
⋮ **Shims and/or grout must completely fill any gaps between the floor and bottom of the base frame. Shims under lag plates must fit tightly without causing deflection of the lag plate. The lag bolts are not to be used to deflect the frame or lag plates in order to compress the lag angle onto the shim. Full structural support of the entire base frame is required in any installation.**
⋮
⋮

25. Fill any remaining gaps between the floor and bottom of the base frame with shims and/or grout to ensure the base frame is fully supported.
26. Mark and drill the holes for the anchors. All four anchor points must be used. The lag plate hole diameter is typically 3/4", but confirm before installation.

NOTICE

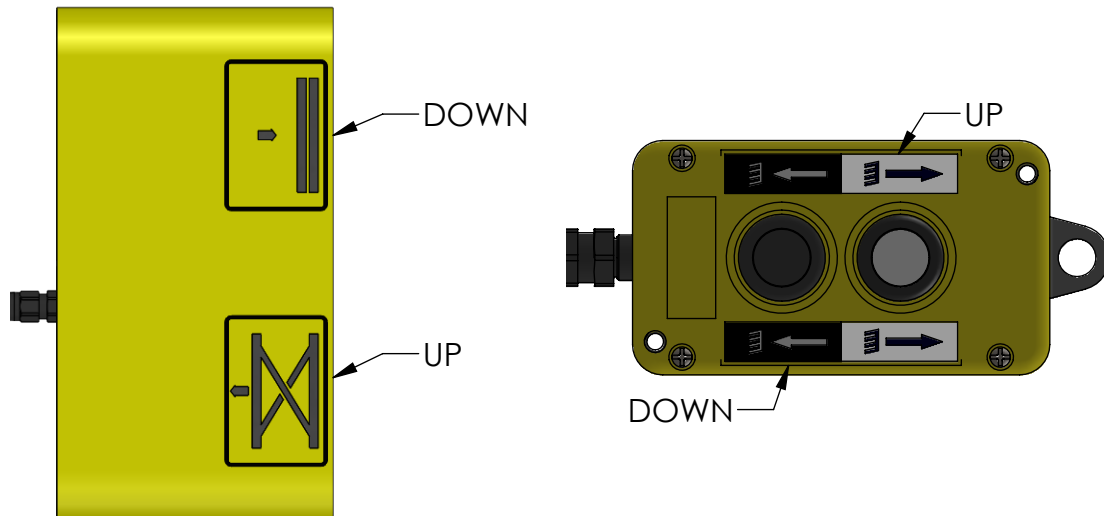
⋮
⋮ **Anchor bolts are to be provided by the installer/owner.**
⋮

27. Install anchors. Verify the machine is level before tightening the anchors.
28. Turn on house power.
29. Disengage the ESTOP pushbutton (if applicable).

30. Press and release (for maintained contact) or press and hold (for standard) the UP ARROW pushbutton on the controls.
31. After the platform has reached fully raised height, relocate the maintenance device(s) back into its(their) original storage position(s). See **Engaging Maintenance Device(s)** section for more detail.
32. Press and release (for maintained contact) or press and hold (for standard) the DOWN ARROW pushbutton on the controls.
33. Once the platform has reached fully lowered height, the machine is now installed and ready for testing.

4.14 Testing (Press and Hold [Standard] Controls)

Standard controls on most lift tables are momentary (press and hold) type. This means that once the UP or the DOWN pushbuttons/foot pedals are pressed and held, the platform will continue raising or lowering respectively and stopping only when pushbuttons/foot pedals are released or they reach the limit of the travel.



To raise the lift table platform, press and hold the UP pushbutton/foot pedal on the controls. The lift motor will start and the lift table platform will begin to raise until it has reached the fully raised height or the pushbutton/foot pedal is released. After the platform has reached the fully raised height, the motor will not turn off until the UP pushbutton/foot pedal is released or a properly adjusted UP limit/proximity switch (if so equipped) has been activated.

NOTICE

⋮
 ⋮ **Once the platform has reached the fully raised height, do not continue to press the UP pushbutton/foot pedal, as this could damage the machine.**
 ⋮
 ⋮

To lower the lift table platform, press and hold the DOWN pushbutton/foot pedal on the controls. The down valve will energize and the platform will begin to lower until it reaches the fully lowered height or the pushbutton/foot pedal is released. The down valve will not de-energize until the DOWN pushbutton/foot pedal is released or a properly adjusted DOWN limit/proximity switch (if so equipped) has been activated.

To stop the movement of the platform, whether it is raising or lowering, just release the UP

or DOWN pushbutton/foot pedal respectively.

1. Press and hold the UP pushbutton/foot pedal. During the ascent, release the pushbutton/foot pedal. The lift motor should immediately turn off and the platform should stop raising.
2. Press and hold the UP pushbutton/foot pedal. Allow the platform to reach fully raised height before releasing the pushbutton/foot pedal.
3. Press and hold the DOWN pushbutton/foot pedal. During the descent, release the pushbutton/foot pedal. The down valve should immediately be de-energized and the platform should stop lowering.
4. Press and hold the DOWN pushbutton/foot pedal. Allow the platform to reach fully lowered height before releasing the pushbutton/foot pedal.

NOTICE

Anytime the down valve is energized, a lit LED should be visible {Standard} on the valve solenoid. If the valve solenoid does not have an embedded LED, another way to check to see if the solenoid is energized is to place the end of a standard screwdriver next to the solenoid. If you can feel some pull (magnetized), it suggests the solenoid is still energized. Also, when fully lowered, the down valve voltage should be at 0.

5. Press and hold the UP pushbutton/foot pedal. Allow the platform to reach fully raised height, then release the pushbutton/foot pedal.
6. Measure the height from the floor to the top of the raised platform.
7. After about 3 hours, measure this height again. The change in height should be no more than approximately 0.5 inches.
8. Press and hold the DOWN pushbutton/foot pedal until the platform is at fully lowered height.
9. Repeat these steps with a load whose center of gravity (CG) is centered on the platform.
10. On lift tables with an adjustable down speed flow control valve, note that it may be adjusted to achieve more desirable results. To do this, it will be necessary to engage the maintenance device(s). See **Engaging Maintenance Device(s)** and **Adjusting Down Speed Flow Control Valve** sections.
11. Once the maintenance device(s) is(are) engaged, adjust the down speed flow control valve. See **Adjusting the Down Speed Flow Control Valve** section.
12. Disengage the maintenance device(s), and recheck the time it takes to lower. If satisfactory, continue to step 13. If otherwise, go back to step 10.
13. Press and hold the DOWN pushbutton/foot pedal until the platform is at fully lowered height.
14. Testing is complete.

CAUTION

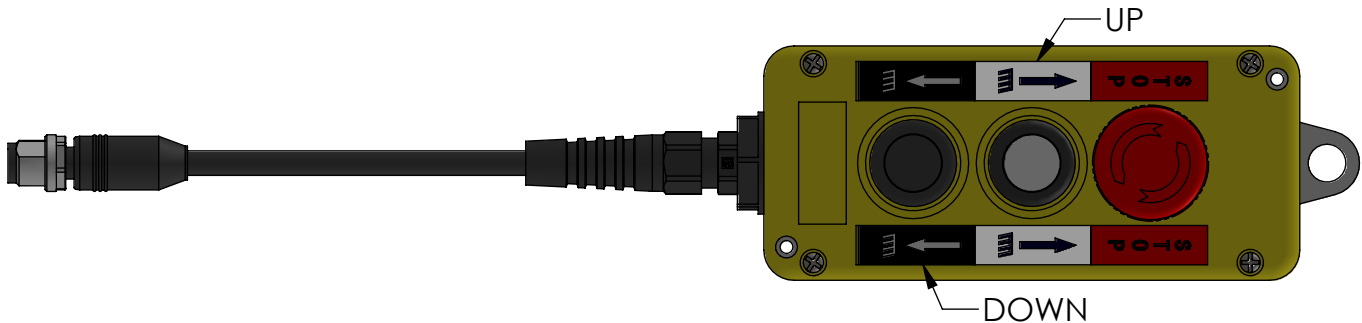
When not in use, always lower the platform to fully lowered height.

4.15 Testing (Press and Release [Maintained Contact] Controls)

NOTICE

If the motor does not stop when the platform reaches fully raised height, press the STOP pushbutton. See Adjusting Limit Switches and Hard Stops or Adjusting Limit or Proximity Switches sections.

If the controls on this lift table are maintained contacts type, it means that once the UP ARROW or the DOWN ARROW pushbuttons are pressed and released, the platform will continue raising or lowering respectively stopping only when a limit switch is reached or the STOP pushbutton is pressed.



- **To raise the lift table platform**, press and release the UP ARROW pushbutton on the controls. The lift motor will start and the lift table platform will begin to raise until it has reached the fully raised height. The motor will turn off automatically once the upper travel limit switch is reached and the UP ARROW pushbutton will be disabled.
 - **To lower the lift table platform**, press and release the DOWN ARROW pushbutton on the controls. The down valve will energize and the platform will begin to lower until it reaches the fully lowered height. The down valve will de-energize automatically once the lower travel limit switch is reached and the DOWN ARROW pushbutton will be disabled.
 - **To stop the movement of the platform**, whether it is raising or lowering, just press the STOP pushbutton. This will disable the UP ARROW or DOWN ARROW pushbuttons and prevent the motor from turning on and the down valve from being energized. Turn the STOP pushbutton in direction of arrows to enable the controls again.
1. Press and release the UP ARROW pushbutton. During the ascent, press the STOP pushbutton. The lift motor should immediately turn off and the platform should stop raising.
 2. Press and release the UP ARROW pushbutton. The motor should not turn on, nor should the platform raise.
 3. Press and release the DOWN ARROW pushbutton. The down valve should not energize, nor should the platform lower.
 4. Disengage the STOP pushbutton.
 5. Press and release the UP ARROW pushbutton. Allow the platform to reach fully raised height.
 6. Press and release the UP ARROW pushbutton. The motor should not turn on, nor should the platform raise.

7. Press and release the DOWN ARROW pushbutton. During the descent, press the STOP pushbutton. The down valve should immediately be de-energized and the platform should stop lowering.
8. Press and release the UP ARROW pushbutton. Nothing should move.
9. Press and release the DOWN ARROW pushbutton. Nothing should move.
10. Disengage the STOP pushbutton.
11. Press and release the DOWN ARROW pushbutton. Allow the platform to reach fully lowered height.

NOTICE

Anytime the down valve is energized, a lit LED should be visible {Standard} on the valve solenoid. If the valve solenoid does not have an embedded LED {Classic}, another way to check to see if the solenoid is energized is to place the end of a standard screwdriver next to the solenoid. If you can feel some pull (magnetized), it suggests the solenoid is still energized. Also, when fully lowered, the down valve voltage should be at 0. If the down valve does not de-energize when the platform reaches fully lowered height, press the STOP pushbutton. See **Adjusting Limit Switches and Hard Stops** section.

12. Press the STOP pushbutton. Pressing the UP ARROW or DOWN ARROW should produce no sound or movement.
13. Disengage the STOP pushbutton.
14. Press and release the UP ARROW pushbutton. Allow the platform to reach fully raised height.
15. Measure the height from the floor to the top of the raised platform.
16. After about 3 hours, measure this height again. The change in height should be no more than approximately 0.5 inches.
17. Press and release the DOWN ARROW pushbutton. While the platform is lowering, record the time it takes to lower. If the time is acceptable, continue to step 18. If otherwise, jump to step 21.
18. The platform should return to fully lowered position.
19. Repeat these steps with a load whose center of gravity (CG) is centered on the platform.
20. Testing is complete.
21. On lift tables with an adjustable down speed flow control valve, the valve may be adjusted to achieve more desirable results. To do this, it will be necessary to engage the maintenance device(s). See **Engaging Maintenance Device(s)** and **Adjusting Down Speed Flow Control Valve** sections.
22. Once the maintenance device(s) is(are) engaged, adjust the down speed flow control valve. See **Adjusting the Down Speed Flow Control Valve** section.

23. Disengage the maintenance device(s), and recheck the time it takes to lower. If satisfactory, continue to step 24. If otherwise, jump to step 21.
24. Press and release the DOWN ARROW pushbutton.
25. The platform should return to fully lowered position.
26. Testing is complete.

 **CAUTION**

When not in use, always lower the platform to fully lowered height and press the STOP pushbutton to prevent unintended operation.

5 OPERATION

DANGER

Only authorized, trained and qualified personnel shall operate this machine. Personnel operating this machine must read and understand this manual.

Personnel are not permitted on the platform unless ANSI MH29.1 compliant personnel guarding is provided. Guarding must be installed and operational before use including all handrails, personnel gates & equipment gates.

In the event of a malfunction, disconnect and lock-out the machine. Do not return to service until the cause of the malfunction has been determined and remedied.

Pinch points and Crush Hazards exist when moving the machine. Do not enter under any equipment while moving. Keep hands, feet, and loose clothing away from moving equipment.

Do not enter beneath the platform.

Keep loose clothing away from machine during operation.

Loads that may shift during operating must be secured before operating.

Do not enter beneath the platform.

Verify the area around the machine is clear of debris and/ or personnel before operating.

This machine must be operated only indoors on substantially firm, smooth, even, and prepared surfaces.

Always keep power and control cords clear of foot and vehicle traffic during operation.

During operation, operator must be in view of the machine at all times.

Do not load or unload the machine while moving.

NOTICE

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⋮ **If included, all lifting eyes on the platform used to position the machine must be removed before operating the machine or the machine may be damaged.**
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⋮

This machine is to be operated by trained and/or qualified personnel only.

Before operating this machine, read and understand this manual. Inspect the machine for excessive wear and/ or damage. If excessive wear or damage is found, remove the machine from service and contact maintenance personnel. Do not operate this machine until all necessary repairs are completed. Inspect all precautionary labeling. If any label is missing or illegible contact the manufacturer for replacement labels. Ensure area is free of debris.

Before each shift, inspect the machine for signs of wear or damage. Verify all precautionary labeling is legible. Report concerns to the appropriate personnel.

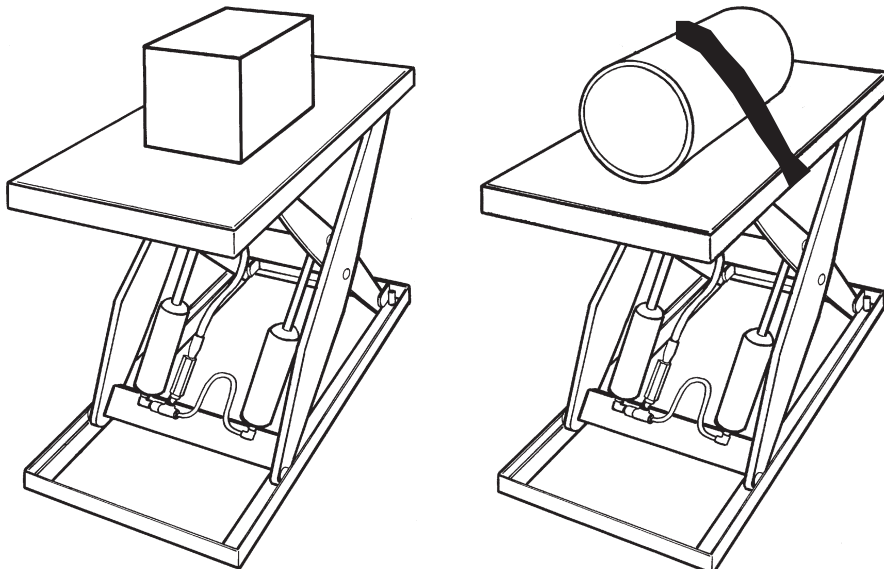
(Reference the video queued up from scanning the QR code below to become more familiar with the LS Series Lift Table. Keep in mind that in mid 2023, our design and components for this lift table have changed but much of the functionality has either been retained or improved.)



Controls shown on the next page cover our standard controls and our optional E-Stop and Maintained Contact controls.

5.1 Loading

Loads must not exceed the specified load center and capacity. Loads must be uniformly distributed and secured. Uneven and excess loading will cause accelerated wear and may lead to premature failure. See **Tech Sheet No. S-13** for detailed information.



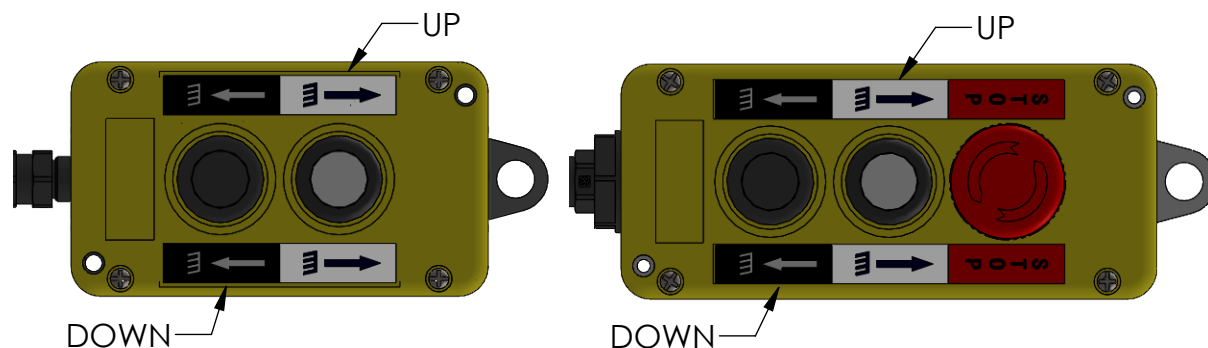
5.2 Raising and Lowering the Platform (Press and Hold [Standard] Controls)

To raise the lift table platform, press and hold the UP ARROW pushbutton on the controls. The lift motor will start and the lift table platform will begin to raise until it has reached the fully raised height or until the pushbutton is released. The motor will continue to run even after the fully raised height has been reached until the UP ARROW pushbutton has been released unless equipped with an upper travel limit switch.

NOTICE

Once the platform has reached the fully raised height, do not continue to press the UP ARROW pushbutton, as this could damage the machine.

To lower the lift table platform, press and hold the DOWN ARROW pushbutton on the controls. The down valve will energize and the platform will begin to lower until it reaches the fully lowered height or until the pushbutton is released. The down valve will continue to be energized even after the fully lowered height has been reached until the DOWN ARROW pushbutton has been released.



5.3 Engaging the Emergency Stop (If Provided)

To stop the movement of the platform whether it is raising or lowering, press the STOP pushbutton. This will disable the UP ARROW or DOWN ARROW pushbuttons and prevent the motor from turning on and the down valve from being energized. Turn the STOP pushbutton in direction of arrows to enable the controls again.

CAUTION

When not in use, always lower the platform to fully lowered height and press the STOP button if equipped to prevent unintended operation.

5.4 Raising and Lowering the Platform (Press and Release [Maintained Contact] Controls)

To raise the lift table platform, press and release the UP ARROW pushbutton on the controls. The lift motor will start and the lift table platform will begin to raise until it has reached the fully raised height. The motor will turn off automatically once the upper travel limit switch is reached and the UP ARROW pushbutton will be disabled.

To lower the lift table platform, press and release the DOWN ARROW pushbutton on the controls. The down valve will energize and the platform will begin to lower until it reaches the fully lowered height. The down valve will de-energize automatically once the lower travel limit switch is reached and the DOWN ARROW pushbutton will be disabled.

To stop the lift table platform, whether it is raising or lowering, press the STOP pushbutton. This will disable the UP ARROW or DOWN ARROW pushbuttons and prevent the motor from turning on and the down valve from being energized. Turn the STOP pushbutton in direction of arrows to enable the controls again.

CAUTION

When not in use, always lower the platform to fully lowered height and press the STOP button if equipped to prevent unintended operation.

DANGER

High voltage can cause severe injury or death. Disconnect/lockout electrical power before performing maintenance or repair. In the event of a malfunction, disconnect and do not return to service until the cause of the malfunction has been determined and remedied.

Pressurized fluids can penetrate skin and cause severe injury or death. Always use proper personal protective equipment when repairing or maintaining pressurized systems. Relieve hydraulic system pressure before performing any maintenance on the hydraulic system. Treat all lines as if pressurized and open any necessary fitting slowly and do not completely disconnect until all pressure has been relieved. See Relieving Hydraulic System Pressure section.

All electrical components and the hydraulic power unit must be protected from wet and/or dirty environments unless specifically configured for such environments.

Never enter beneath the platform unless the machine is unloaded and secured against lowering using the maintenance device(s). See Engaging Maintenance Device(s) section.

Only authorized, trained, and qualified personnel shall operate this machine. Personnel operating this machine must read and understand this manual.

Keep loose clothing away from machine during operation.

Personnel are not permitted on the platform unless ANSI MH29.1 compliant personnel guarding is provided. Guarding must be installed and operational before use including all handrails, personnel gates & equipment gates.

Do not change the hydraulic power unit relief valve setting. It has been set at the factory for the lift table and should not require any adjustment.

Failure to perform required inspections and maintenance along with replacing worn consumable items such as bushings and rollers will lead to shortened lift table life. Failures resulting from lack of inspection, maintenance and consumable parts replacement will not be covered under warranty.

If damage or excessive wear is found, remove the machine from service until the machine is repaired.

⚠ CAUTION

Verify the area around the machine is clear of debris and/ or personnel before operating.

Always keep power and control cords clear of foot and vehicle traffic.

This machine must be operated only indoors on substantially firm, smooth, even, and prepared surfaces.

A substantial number of feature and function combinations exist when custom equipment is provided by a manufacturer. Images illustrated throughout this manual are only representative samples of designs that may or may not exist in the machine this general manual was provided for. When questioning whether any part of this manual applies specifically to your machine, you may contact customer service with your order number and/or the serial number for your machine, and we will provide the specific drawing(s) that combined with this manual will provide sufficient information to install, test, operate and maintain the equipment.

If included, all lifting eyes must be removed from the platform top before attempting to operate the machine or the machine will be damaged.

Inspect the machine for signs of wear or damage. Verify all precautionary labeling is legible.

6.1 Engaging Maintenance Device(s)

Any time it is necessary to maintain or repair this machine and the platform is required to be in a raised position, the maintenance device(s) shall be engaged. This section will be referenced several times throughout this manual and should be thoroughly understood before working on this machine.

⚠ DANGER

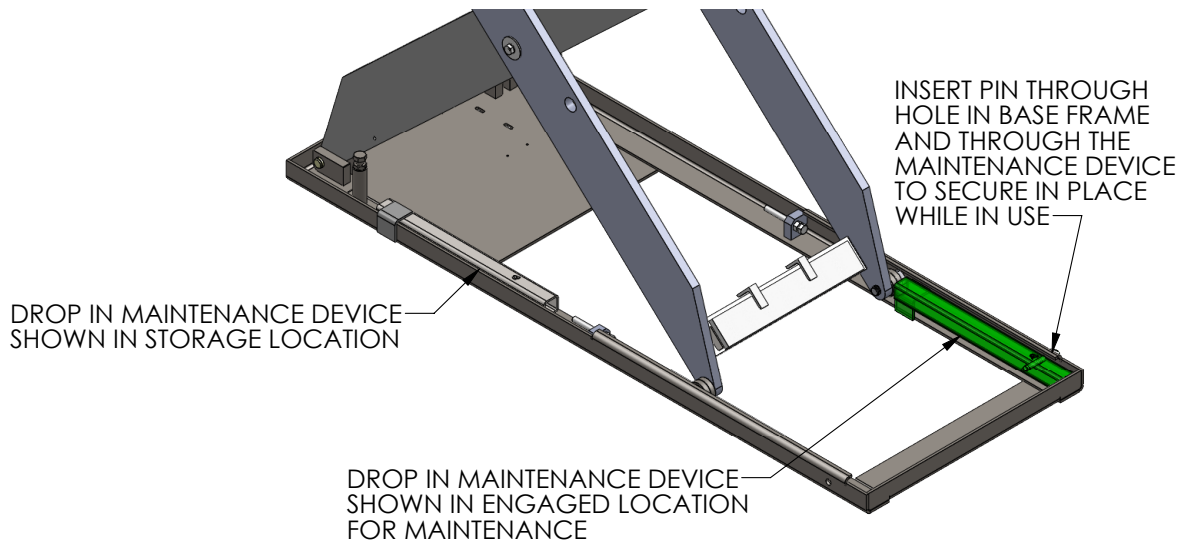
DO NOT enter beneath the platform until load has been removed and the machine is secured against lowering using the supplied maintenance device(s). If the supplied maintenance device(s) cannot be used, temporary supports will be required to fulfill the same purpose and application.

The supplied maintenance device(s) is(are) designed to support the weight of an **UNLOADED** machine only. Failure to remove the live load before engaging the maintenance device(s) may result in failure and allow the machine to fall unexpectedly.

DANGER

High pressure fluids can penetrate skin and cause severe injury or death. Always relieve hydraulic system pressure before performing maintenance or repair of the hydraulic system.

6.1.1 {Standard} Maintenance Device



Before performing any maintenance or repair:

1. Remove any live load on the platform of the machine.
2. Verify that all personnel and debris are clear of the work area.
3. Raise the platform to almost fully raised height. If the fully raised height is limited by an UP limit switch that does not allow the platform to raise high enough to engage the maintenance device, the UP limit switch will need to be electrically bypassed, continue to the next step. If the platform is high enough, jump to step 12.
4. If equipped, turn on the maintenance bypass switch and continue to raise the platform to almost fully raised height, then jump to step 12. If not equipped with a maintenance bypass switch continue to the next step.

NOTICE

Before raising the platform to almost fully raised height, ensure there are no obstacles in the way that may be damaged or damage the machine while raising.

Raising the platform to almost fully raised height typically allows more space in front of the lower rollers to more easily engage the maintenance device, though raising the platform just high enough to do this would be sufficient.

Keep in mind that if the platform is at fully raised position, it will not be able to be raised to release any temporary support being used in place of the machine's standard maintenance device.

5. If the machine has an internal HPU, the platform will need to be secured by a suitable means other than the machine's standard maintenance device.
6. Once the platform is securely prevented from falling, remove the control box cover.
7. If the machine has an external HPU, just remove the control box cover.

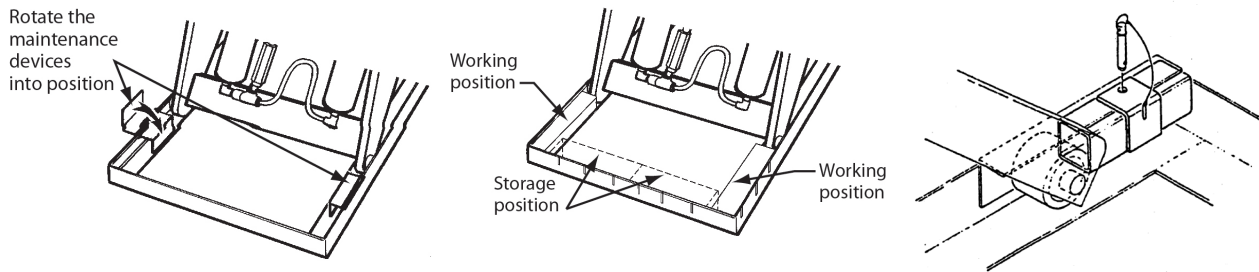
NOTICE

• **Compare images in the Compact Control Box and Standard Control Box sections to determine which has been provided with this lift table.**

•

8. If it is a standard control box, the UP limit switch may be electrically bypassed by switching the UPPER LIMIT SWITCH DIP switch to off.
9. If it is a compact control box, the UP limit switch may be electrically bypassed by switching the MAINTENANCE BYPASS DIP switch to on. Replace the control box cover.
10. Remove the temporary platform support.
11. Raise the platform to almost fully raised height.
12. Place the maintenance device on the right side as viewed from the roller end of the lift, into the lower roller track between the lower roller and the base frame end to allow it to engage the roller when the platform is lowered. See image on previous page.
13. Insert the tethered pin through the base frame and fully through the maintenance device to secure it in place while in use.
14. Lower the platform until the weight of the platform and leg set is supported by the roller resting up against the maintenance device.
15. Relieve system pressure. See **Relieving System Pressure** section.
16. Disconnect electrical supply and lock out the machine to prevent unintended actuation of the machine.
17. After installation, maintenance or repair is complete, verify all tools, debris, and personnel are clear of the area. Clean up any spills.
18. Re-energize the machine.
19. Raise the platform to almost fully raised position.
20. If the machine has an internal HPU, the platform will need to be secured by a suitable means other than the machine's standard maintenance device.
21. Once the platform is securely prevented from falling, remove the control box cover.
22. Return the UPPER LIMIT SWITCH DIP switch to on or the MAINTENANCE BYPASS DIP switch to off and replace the control box cover.
23. Remove the temporary platform support.
24. Disengage the maintenance device by removing the pin and device from the lower roller track and returning it back to its original storage location.
25. Lower the platform to the fully lowered position.
26. Test for proper operation.

6.1.2 [Classic] Maintenance Device(s)



Before performing any maintenance or repair:

1. Remove any live load on the platform of the machine.
2. Verify that all personnel and debris are clear of the work area.
3. Raise the platform to almost fully raised height. If the almost fully raised height is limited by an UP limit switch that does not allow the platform to raise high enough to engage the maintenance device(s), the UP limit switch will need to be electrically bypassed, continue to next step. If the platform is high enough, jump to step 14.

NOTICE

Before raising the platform to almost fully raised height, ensure there are no obstacles in the way that may be damaged or damage the machine while raising.

Raising the platform to almost fully raised height typically allows more space in front of the lower rollers to more easily engage the maintenance device(s), though raising the platform just high enough to do this would be sufficient.

Keep in mind that if the platform is at fully raised position, it will not be able to be raised to release any temporary support other than the machine's standard maintenance device(s).

4. If the lift table has a maintenance bypass switch, turn it on and jump to step 13.
5. If the lift table has an external control panel, the limit switch may be bypassed at that location.
6. Disconnect electrical supply and lock out and tag out the machine to prevent unintended actuation of the machine.
7. Open the control panel and insert an UP limit switch jumper while referencing the **Electrical (Classic)** section.

NOTICE

Contact customer service for your machine specific schematic if unsure whether the typical electrical schematic in this manual applies.

8. If the lift table is powered with 115/1/60 and the HPU is mounted internally, the limit switch may be bypassed at the junction box at the base frame.

9. To access the inside of the junction box at the base frame, the platform will need to be secured by a suitable means other than the machine's standard maintenance device(s) until it can be raised high enough and lowered onto the machine's standard maintenance device(s).
10. Once the platform is securely prevented from falling, remove the junction box cover and insert an UP limit switch jumper while referencing the **Electrical (Classic)** sections and the electrical schematic and control panel drawings for the specific machine.
11. Remove the temporary platform support if used in previous steps.
12. Re-energize the machine.
13. Raise the platform to almost fully raised height.
14. Remove the maintenance device(s) from the storage location and install into the roller tracks between the rollers and the end of the base frame to allow it to engage the roller when the platform is lowered. See images above.
15. Lower the platform until the weight of the platform and leg set is supported by the roller resting up against the maintenance device(s).
16. Relieve system pressure. See **Relieving System Pressure** section.
17. Disconnect electrical supply and lock out the machine to prevent unintended actuation of the machine.
18. After installation, maintenance or repair is complete, verify all tools, debris, and personnel are clear of the area. Clean up any spills.
19. Re-energize the machine.
20. Raise the platform to almost fully raised position.
21. If UP limit switch jumpers were not required, continue to step 26.
22. Disconnect electrical supply and lock out the machine to prevent unintended actuation of the machine.
23. If the UP limit switch jumper was installed in the junction box at the base frame, the platform will need to be secured by a suitable means other than the machine's standard maintenance device(s).
24. Remove the jumper for the UP limit switch and either replace the junction box cover or close the control panel cover.
25. Remove the temporary platform support if used in previous steps.
26. Re-energize the machine.
27. Disengage the maintenance device(s) by removing from the lower roller track and returning it(them) back to its(their) original storage/stowed location(s).
28. Lower the platform to the fully lowered position.
29. Test for proper operation.

DANGER

Pressurized fluids can penetrate skin and cause severe injury or death. Always use proper personal protective equipment when repairing or maintaining pressurized systems. Relieve hydraulic system pressure before performing any maintenance on the hydraulic system. Treat all lines as if pressurized and open any fitting slowly and do not completely disconnect until all pressure has been relieved.

Always lockout/tagout house power before opening or working in any control box/panel.

Relieving hydraulic pressure is done with the platform in maintenance position with the lower roller(s) resting against the maintenance device(s). Note that the procedures below do not apply if the machine includes double acting cylinders (power up, power down), or if the machine includes more sophisticated controls and hydraulics not seen in this manual. Contact Customer Service with your serial number for specific drawings and assistance.

In the case where there is suspicion that the down valve is not working correctly, it may be necessary to release pressure by very slowly loosening up the pressure hose connection at the HPU, if accessible and do not completely disconnect until all pressure has been relieved. If this is needed, make sure to have a clean container and rags handy and clean up any residual fluid spills accordingly.

.....
An energized open down valve will have an illuminated solenoid LED {Standard}. If there is no solenoid LED present {Classic}, hold the end of a flat head screwdriver near the coil. An energized coil generates a magnetic field which should slightly attract the flat head screwdriver. A non-energized coil will not attract the screwdriver. The following procedures assume properly functioning controls and valving.
.....

6.2.1 Press and Hold [Standard] Controls

1. With the platform at a raised height with the lower roller(s) resting against the maintenance device(s), press and hold the DOWN button for 5 to 8 seconds to relieve hydraulic system pressure in the cylinders and the hose between the hydraulic power unit and the cylinders.
2. With the platform in the fully lowered position, press and hold the DOWN button for 5 to 8 seconds to relieve hydraulic system pressure in the cylinders and the hose between the hydraulic power unit and the cylinders. Note that this procedure does not apply if a down limit switch has been installed and wired to shut off the down valve when contact is made. Contact Customer Service if any assistance is needed.

6.2.2 Press and Release [Maintained Contact] Controls

1. With the platform at a raised height with the lower roller(s) resting against the maintenance device(s), press and release the DOWN button to relieve hydraulic system pressure in the cylinders and the hose between the hydraulic power unit and the cylinders.
2. After the 5 to 8 seconds, press the STOP button to de-energize the down valve.

NOTICE

⋮
⋮ **Since a down limit switch is included for maintained contact controls, this**
⋮ **procedure shall be accomplished with the platform in maintenance position with**
⋮ **the lower roller(s) resting against the maintenance device(s).**
⋮

6.3 Manually Raising Platform

At some point, it may be necessary to manually lift the platform to get the leg set positioned to engage the maintenance device(s). The following steps will be necessary to accomplish this task. The lift table should be lagged down for this procedure or the baseframe will need to be otherwise held down.

DANGER

The supplied maintenance device(s) must be used. Failure to properly engage the maintenance device(s) may lead to machine failure and injury. If the supplied maintenance device(s) cannot be used, temporary supports will be required to fulfill the same purpose and application.

The supplied maintenance device(s) for this lift table is(are) designed to support only the unloaded machine and is not to be used while the platform is loaded. Failure to remove the live load before engaging the(all) maintenance device(s) may result in failure and allow the machine to fall unexpectedly.

Avoid stepping under platform when maintenance device(s) is(are) not engaged, do not relocate the maintenance device(s) until the platform is securely held in place using a suitable means for interim support.

Pressurized fluids can penetrate skin and cause severe injury or death. Always use proper personal protective equipment when working with pressurized systems. Relieve hydraulic system pressure before performing any maintenance on the hydraulic system.

The procedures below assume a single lift table with single acting cylinders. If your machine has double acting cylinders or it is a dual or tandem lift table, contact Customer Service to determine the procedure for your application.

Approximate platform weight: Review shipping documents to determine total machine weight.

1. Remove the live load from the platform, refer to danger messages above.
2. Verify that all personnel and debris are clear of the work area.
3. Relieve the hydraulic system pressure. See **Relieving System Pressure** section.
4. Disconnect electrical supply and lock out the machine to prevent unintended actuation of the machine.
5. Using platform only lifting eye positions and load spreader bars (see **Positioning the Lift Table (With Lifting Eyes)** section), slowly raise platform until the maintenance device(s) may be engaged. See **Engaging Maintenance Device(s)** section.

6. If lifting eyes are not available, lift platform from the hinged end only, slowly raise platform until the maintenance device(s) may be engaged. The hinged end of the platform is the end opposite where the rollers are located. See **Engaging Maintenance Device(s)** section.
7. Using a suitable means for interim support, engage the maintenance device(s). See **Engaging Maintenance Device(s)** section.
8. Lower the platform until the maintenance device(s) is(are) fully engaged and the weight of the machine is supported accordingly, and make repairs as necessary.
9. Inspect all upper and lower rollers, hinge points and cylinder mountings to ensure all are in place after the manual raising of the machine. Ensure the upper and lower roller shafts/pins are properly within their respective roller retainers. The lower ends of the cylinders may have shifted out of their seats, ensure the cylinder base elements are seated on the lower pins/cross rods before powering up.
10. After maintenance or repair is complete, verify all tools, debris, and personnel are clear of the area. Clean up any spills.
11. Re-energize the machine.
12. Verify platform will raise off the maintenance device(s) to the fully raised position.

NOTICE

⋮
⋮ **Over-filling the reservoir when the platform is in the raised position will cause the reservoir to be overfilled when the platform is lowered due to the emptying out of the cylinder(s).**
⋮
⋮

13. Disengage the maintenance device(s) and stow it in its(their) storage locations for future use.
14. Lower the machine to the fully lowered position.
15. Test for proper operation. See **Testing** section.

6.4 Adding Hydraulic Fluid (Internal HPU)

DANGER

High pressure fluids can penetrate skin and cause severe injury or death. Always relieve hydraulic system pressure before performing maintenance or repair of the hydraulic system. See **Relieving System Pressure** section.

These machines are typically supplied with Citgo AW 32 hydraulic fluid. Use any compatible fluid. See **Hydraulic Fluid** section. There are other types of fluid available that may be used depending on the application.

Reservoir volume: The usable reservoir capacity varies based on the number and bore of the cylinders and travel range.

Over-filling the reservoir when the platform is in the raised position will cause the reservoir to be overfilled when the platform is lowered due to the emptying out of the cylinder(s).

For internal hydraulic power units, it will be necessary to get access beneath the platform. If the platform does not raise at all or if it does not reach its fully raised height, it may be because the fluid level in the reservoir is inadequate.

To add hydraulic fluid:

1. Raise platform to the fully raised position. See **Manually Raising Platform** section, if necessary.
2. Engage the maintenance device(s). See **Engaging Maintenance Device(s)** section.
3. Remove the breather/fill cap. Before adding fluid, observe and mark if necessary the level of the fluid.
4. Add clean hydraulic fluid, approximately a 1/4 cup at a time.

NOTICE

Do not refill reservoir to max fill line {Standard} while the platform is in a raised position as this could result in overflow once the platform is lowered.

5. Replace breather/fill cap after adding fluid.
6. Disengage the maintenance device(s).
7. Raise and lower the platform five to six times to remove air from the hydraulic system.
8. Repeat steps 1 through 7 as necessary to ensure an adequate fluid level.
9. Lower the platform to the fully lowered position.
10. If after several up and down cycles, the lift achieves full up travel and operates with a smooth hydraulic hum with no signs of pump cavitation such as inability to reach full height (travel up to limit switch) or no vibration through the up travel, you've successfully reached an adequate hydraulic fluid level.
11. Before placing back into production, verify proper operation.

6.5 Adding Hydraulic Fluid (External HPU)

DANGER

High pressure fluids can penetrate skin and cause severe injury or death. Always relieve hydraulic system pressure before performing maintenance or repair of the hydraulic system. See Relieving System Pressure section.

These machines are typically supplied with Citgo AW 32 hydraulic fluid. Use any compatible fluid. See Hydraulic Fluid section. There are other types of fluid available that may be used depending on the application.

Reservoir volume: The usable reservoir capacity varies based on the number and bore of the cylinders and travel range.

If the platform does not raise at all or if it does not reach its fully raised height, it may be because the fluid level in the reservoir is inadequate.

To add hydraulic fluid:

1. Lower platform to the fully lowered position.
2. Remove the breather/fill cap. Before adding fluid, observe and mark if necessary the level of the fluid.
3. Add clean hydraulic fluid. Fluid should be at max fill line **{Standard}** or 3/4" from the top of the reservoir **{Classic}** when the platform is fully lowered. Add if needed.
4. Replace breather/fill cap.
5. Raise and lower the platform five to six times to remove air from the hydraulic system.
6. Lower the platform to the fully lowered position.
7. Add fluid as necessary and replace the breather/fill cap after adding fluid.
8. Repeat steps 1 through 7 as necessary.
9. If after several up and down cycles, the lift achieves full up travel and operates with a smooth hydraulic hum with no signs of pump cavitation such as inability to reach full height (travel up to limit switch) or no vibration through the up travel, you've successfully reached an adequate hydraulic fluid level.
10. Before placing back into production, verify proper operation.

6.6 Replacing Hydraulic Fluid (Internal HPU)

DANGER

High pressure fluids can penetrate skin and cause severe injury or death. Always relieve hydraulic system pressure before performing maintenance or repair of the hydraulic system. See **Relieving System Pressure** section.

A container capable of the usable capacity of hydraulic fluid is required.

These machines are typically supplied with Citgo AW 32 hydraulic fluid. Use any compatible fluid. See **Hydraulic Fluid** section. There are other types of fluid available that may be used depending on the application.

Reservoir volume: The usable reservoir capacity varies based on the number and bore of the cylinders and travel range.

To replace the hydraulic fluid:

1. Raise platform to the fully raised position and engage the maintenance device(s). See **Engaging Maintenance Device(s)** section.
2. Relieve hydraulic pressure, see **Relieving System Pressure** section.
3. Disconnect and lock out electrical power.
4. Remove the breather/fill cap. Before removing existing fluid, observe and mark if necessary the level of the fluid. Using a siphon, insert the end of the suction hose down to the bottom of the reservoir and drain the old fluid into a container and allow the reservoir to empty. Measure the amount of fluid taken out so the same amount can be added back in step 6.
5. After emptying the reservoir, set aside the siphon.
6. Refill reservoir with clean hydraulic fluid using the same amount observed/marked earlier in step 4.

NOTICE

Do not refill reservoir to max fill line {Standard} while the platform is in a raised position as this could result in overflow once the platform is lowered.

7. Replace breather/fill cap after adding fluid.
8. Reconnect power.
9. Disengage the maintenance device(s).
10. Raise and lower the platform five to six times to remove air from the hydraulic system.
11. Repeat steps 1 through 10 two to three more times to fully change the majority of the fluid.
12. Lower the platform to the fully lowered position.

13. If after several up and down cycles, the lift achieves full up travel and operates with a smooth hydraulic hum with no signs of pump cavitation such as inability to reach full height (travel up to limit switch) or no vibration through the up travel, you've successfully replaced the hydraulic fluid.

14. Before placing back into production, verify proper operation.

6.7 Replacing Hydraulic Fluid (External HPU)

DANGER

High pressure fluids can penetrate skin and cause severe injury or death. Always relieve hydraulic system pressure before performing maintenance or repair of the hydraulic system. See Relieving System Pressure section.

A container capable of the usable capacity of hydraulic fluid is required.

These machines are typically supplied with Citgo AW 32 hydraulic fluid. Use any compatible fluid. See Hydraulic Fluid section. There are other types of fluid available that may be used depending on the application.

Reservoir volume: The usable reservoir capacity varies based on the number and bore of the cylinders and travel range.

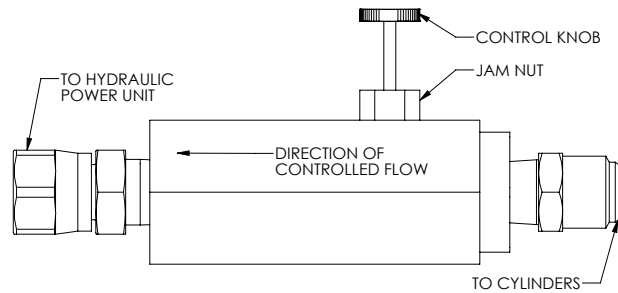
To replace the hydraulic fluid:

1. Lower platform to the fully lowered position.
2. Relieve hydraulic pressure, see **Relieving System Pressure** section.
3. Disconnect and lock out electrical power.
4. Remove the breather/fill cap. Using a siphon, insert the end of the suction hose down to the bottom of the reservoir and drain the old fluid into a container and allow the reservoir to empty. Measure the amount of fluid taken out so the same amount can be added back in step 6.
5. After emptying the reservoir, set aside the siphon.
6. Refill reservoir with clean hydraulic fluid using the same amount observed/marked earlier in step 4.
7. Replace breather/fill cap.
8. Reconnect power.
9. Raise and lower the platform five to six times to remove air from the hydraulic system.
10. Lower the platform to the fully lowered position.
11. Add fluid as necessary and replace the breather/fill cap after adding fluid.
12. Repeat steps 9 through 11 as necessary.

13. If after several up and down cycles, the lift achieves full up travel and operates with a smooth hydraulic hum with no signs of pump cavitation such as inability to reach full height (travel up to limit switch) or no vibration through the up travel, you've successfully replaced the hydraulic fluid.
14. Before placing back into production, verify proper operation.

6.8 Adjusting Down Speed Flow Control Valve

Down speed flow control valves may be fixed or adjustable. This section covers the adjustable type only. The adjustable down speed flow control valve is a pressure compensated flow control valve. The pressure compensation feature assures that the lift descends at about the same speed whether the load on the platform is a few hundred pounds, or at its full rated capacity. The pressure compensated flow control “compensates” for variable pressure to try to hold a constant flow.



The down speed can be set by the customer to suit his application and is re-adjustable if the application should change. At the factory, it is set to be no more than twice the rise speed and it is not recommended (by ANSI MH29.1-2020 - Section 4.10.2.1) to adjust to any more than four times the rise speed, or 30 ft/min (9.1 m/min). The valve can be found mounted in between the cylinders unless the lift table has been supplied with excess flow protectors or velocity fuses, whereby the down speed flow control valve can be found at the HPU. Engage the maintenance device(s) before adjusting. See **Engaging Maintenance Device(s)** section.

To adjust the flow, loosen the jam nut and turn the control knob clockwise to slow the descent of the platform and counterclockwise to speed the descent of the platform. Turn only a quarter turn at a time before tightening the jam nut and test whether the desired speed has been achieved. Repeat this process until a satisfactory speed is met.

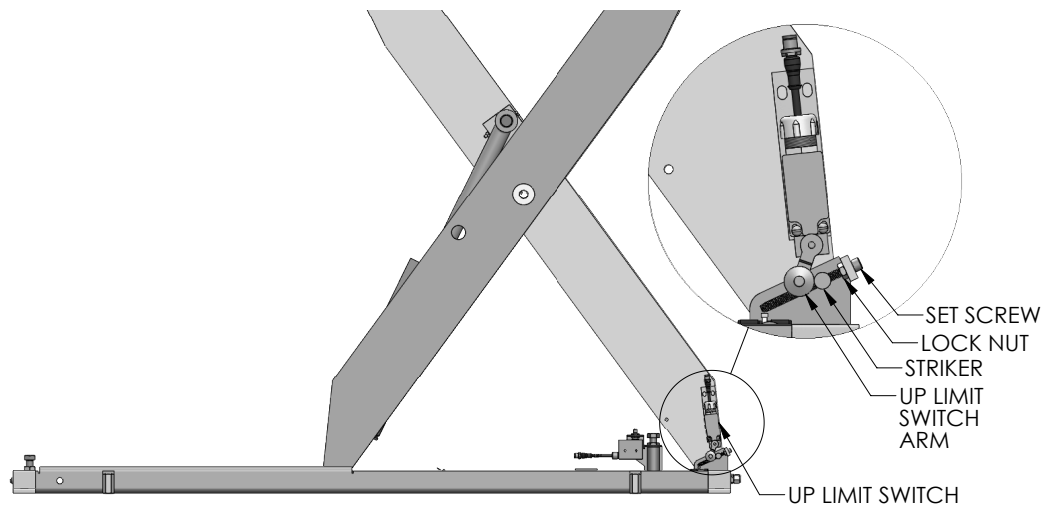
6.9 Adjusting Limit Switches and Hard Stops {Standard}

Limit switches for a machine may be added to accommodate the functionality of the press and release (maintained contact) controls or for other reasons. They are often set for fully raised and/or fully lowered position at the factory but may require adjustment during or after installation. Adjustments for limit switches and proximity switches do have a limited range of adjustability and vary depending on the design. The following information has been provided in the event that a limit switch or hard stop needs adjustment.

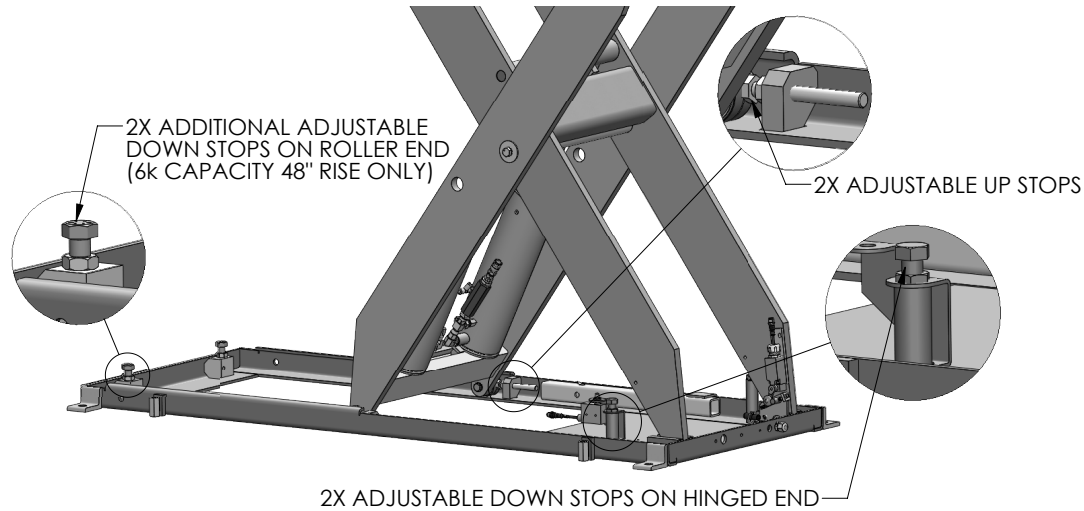
NOTICE

• **The UP limit switch to be adjusted to turn off the motor just before the lower rollers contact the up stops or sooner. Do not allow the rollers to power into the up stops.**

1. If it is necessary to raise the platform higher than the set UP limit switch allows in order to deploy the maintenance device, the UP limit switch will need to be electrically bypassed. For external HPU units, this can be done by opening the standard control box and turning off the UPPER LIMIT SWITCH DIP switch or opening the compact control box and turning on the MAINTENANCE BYPASS switch. Some machines may have an actual keyed maintenance bypass switch which would eliminate the need to open the control box. See **Electrical Functional Description** and **DIP Switch Array** sections. After completing the limit switch adjustment, make sure to turn the UPPER LIMIT SWITCH DIP switch back on or turn the MAINTENANCE BYPASS DIP switch back off and close the box to test for desired effect. For internal HPU units, the platform will need to be raised as high as it can. If the maintenance device cannot be placed in the lower roller track yet, a temporary means of sufficient platform support will be needed so that the technician may safely open the control box and make the adjustments above.
2. To adjust the UP limit switch, release the lock nut and turn the set screw CW to set the raised height higher, and CCW to set the raised height lower. Keep in mind to consider the heights of the the UP stops in conjunction with the UP limit switch.
3. Tighten the lock nut and test until it meets the desired requirements.



4. To adjust the (2) UP stops, loosen the lock nut, then turn the hex bolt CW to set the raised height higher, and CCW to set the raised height lower. Keep in mind to consider the adjustment of the UP limit switch in conjunction with the UP stops.



NOTICE

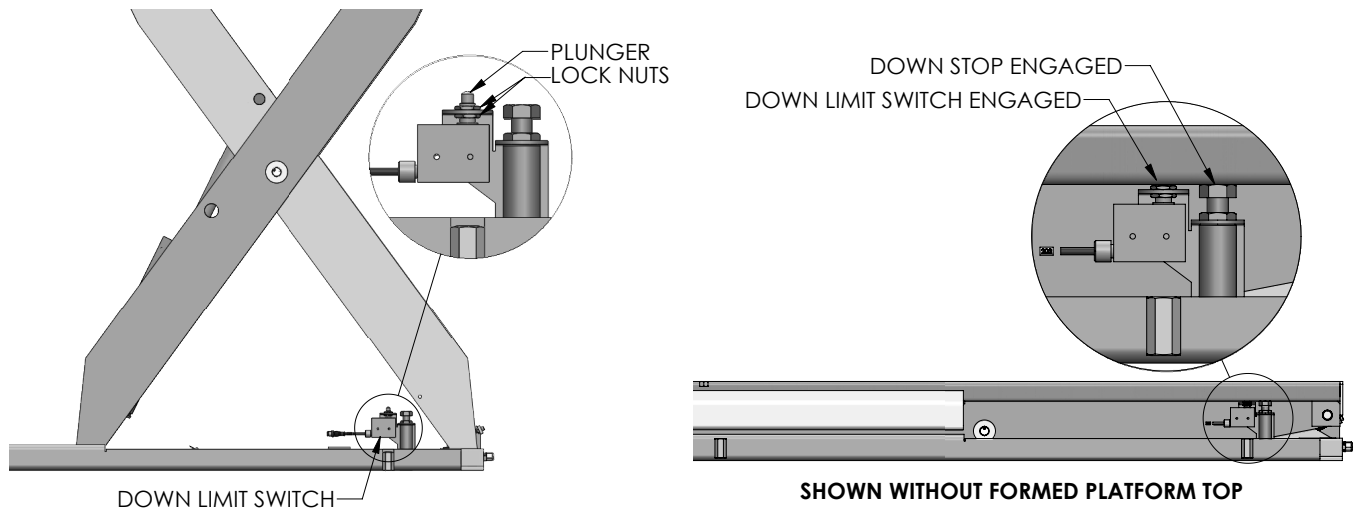
The UP stops should should never be adjusted to a raised height position that does not allow the UP limit switch to stop raising the platform as it is actuated, otherwise damage to the machine may occur.

NOTICE

The DOWN limit switch turns off the down valve as the platform ribs contact the DOWN stops. The DOWN stops should never be adjusted to stop the lowering platform before the DOWN limit switch turns off the down valve nor will the DOWN limit switch be activated before the platform is fully down on the DOWN stops. Full down on the DOWN stops and the triggering of the DOWN limit switch to occur simultaneously.

For external power units, an energized down valve can be confirmed by an illuminated LED on the solenoid {Standard}. If an LED is not found {Classic}, place the end of a flat screwdriver very near the coil. The magnetized field created by the coil should create a bit of a magnetic pull on the screwdriver toward the coil. If a magnetic pull is not felt, it could be a sign that the coil is not energized. Also, when fully lowered, the down valve voltage should be at 0.

- To adjust the DOWN limit switch to set the lowered height higher, loosen the lower lock nut and push limit switch up before tightening the upper lock nut.



- To adjust the DOWN limit switch to set the lowered height lower, loosen the upper lock nut and push limit switch down before tightening the lower lock nut.
- To adjust the DOWN stops, loosen the lock nut, then turn the hex bolt CW to set the lowered height lower, and CCW to set the lowered height higher. Keep in mind to consider the adjustment of the DOWN limit switch in conjunction with the DOWN stops.
- Test until it meets the desired requirements.

6.10 Adjusting Limit or Proximity Switches {Classic}

Limit or proximity switches for a machine may be added to accommodate the functionality of the press and release (maintained contact) controls or for other reasons. They are often set for fully raised and/or fully lowered position at the factory but may require adjustment during or after installation. Adjustments for limit switches and proximity switches do have a limited range of adjustability and vary depending on the application. The following information has been provided in the event that a limit switch needs adjustment.

NOTICE

••• **The UP limit or proximity switch to be adjusted to turn off the motor just before the lower rollers contact the up stops or sooner. Do not allow the rollers to power into the up stops.**

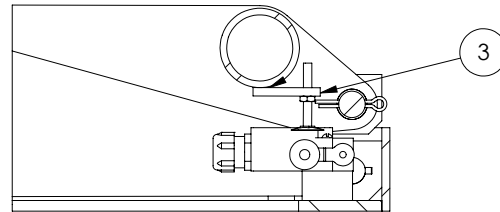
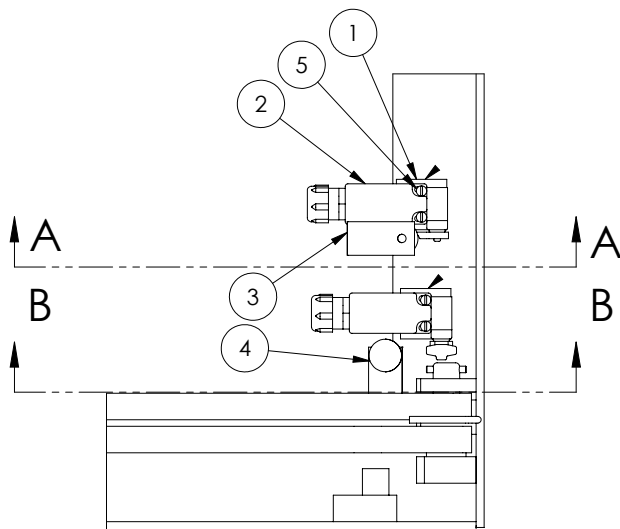
- If it is necessary to adjust an UP limit switch and the current level that the platform travel is being limited to is lower than the platform level necessary to deploy the maintenance device(s), the UP limit switch will need to be electrically bypassed. For external HPU units, this can be done in the control panel by jumping the UP limit switch contacts or by turning on the MAINTENANCE BYPASS switch if available. See electrical diagram and control panel drawing specific to the machine. Contact Customer Service for assistance. For internal HPU units without control panels, the platform will need to be raised as high as it can. Assuming the maintenance device(s) cannot be placed in the lower roller track yet, a temporary means of sufficient platform support will be needed so that the technician may safely open the junction box in the base frame and make the adjustments above. If an external control panel is included, this can be done as it was for the external HPU unit.

NOTICE

The DOWN limit or proximity switch turns off the down valve as the platform ribs contact the DOWN stops. The DOWN limit or proximity switch should never be adjusted to stop lowering the platform before it is fully down on the DOWN stops. Full down on the DOWN stops and the triggering of the DOWN limit or proximity switch to occur simultaneously.

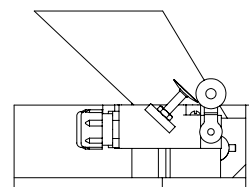
Another reason DOWN limit or proximity switches are used is to provide a signal to a system that a lift table platform is at its lowest position. These switches are never to be used to temporarily hold a platform at a level above its hard down stops indefinitely as down drift is always possible with hydraulic lift tables.

- Most adjustments for limit switches are mainly done by releasing the striker lock nut and turning the striker clockwise or counter-clockwise to achieve the desired result. See illustration below. Section A-A illustrates a lower travel limit switch with the legs shown in the lowered position. Section B-B illustrates an upper travel limit switch with the legs shown in the raised position.



SECTION A-A

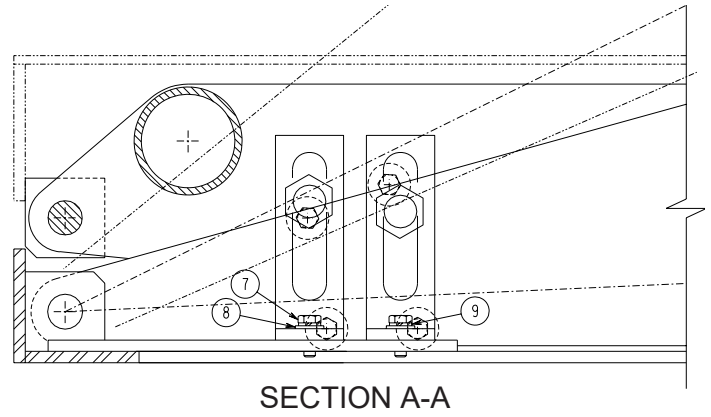
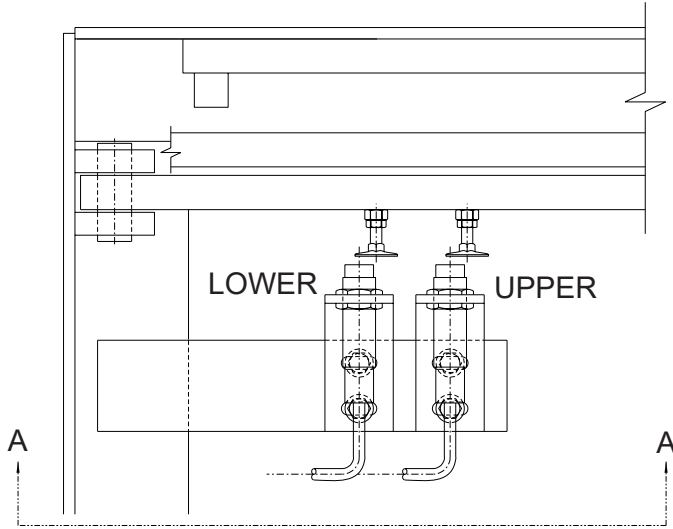
SCALE 1:4



SECTION B-B (RAISED)

SCALE 1:4

3. Most adjustments for proximity switches are mainly done by loosening the lock nuts on the bracket holding the switch to the machine and moving along the slotted hole to achieve the desired result. See illustration below. Section A-A illustrates both the upper and lower proximity switch with the legs shown in both the raised and lowered positions.



6.11 Base Frame Torque Specifications {Standard}

The following information covers the base frame torque specifications for our standard features.

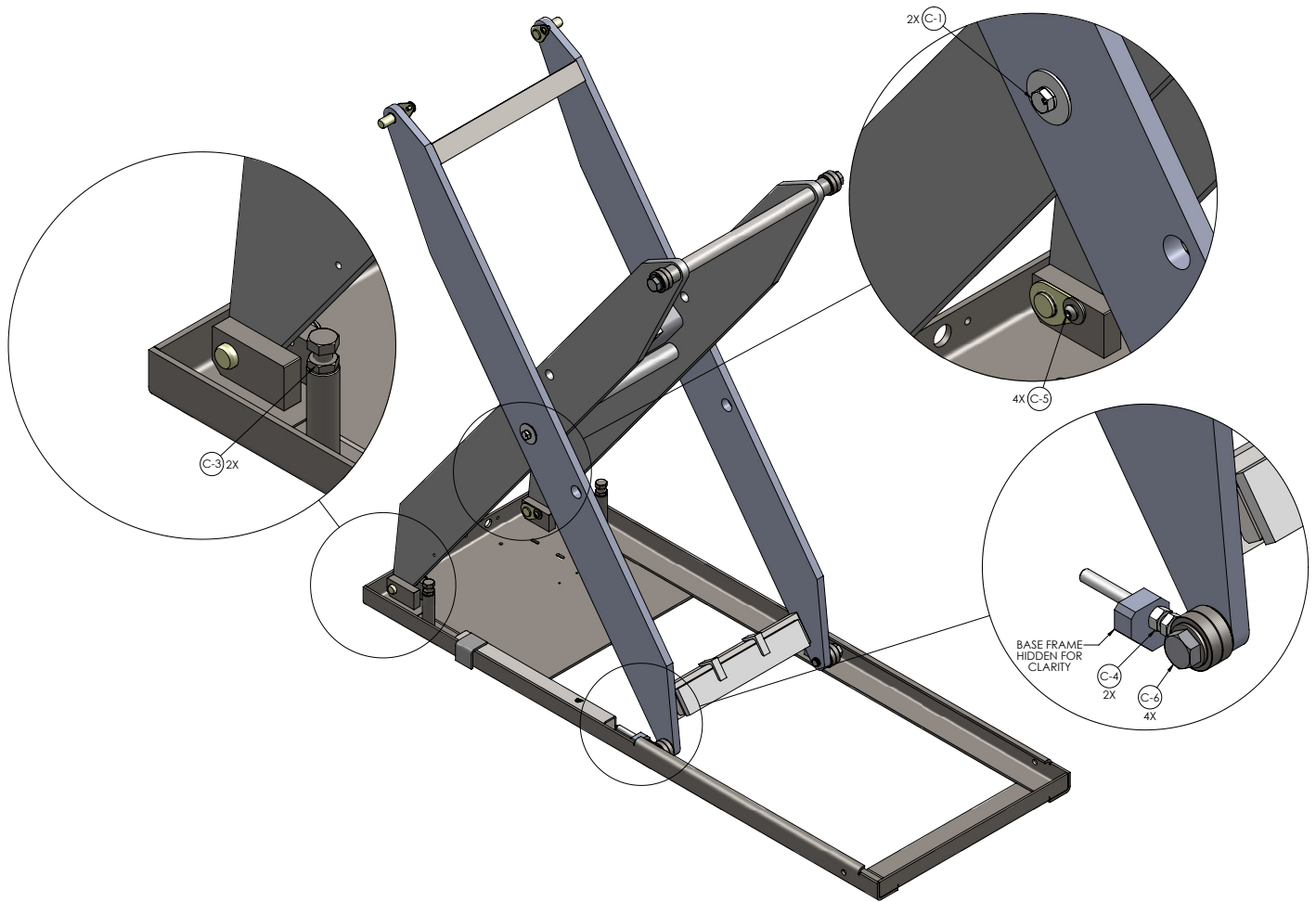


TABLE 1: BOLTED CONNECTIONS ASSEMBLED TORQUE VALUES

CONNECTION DESIGNATOR	CONNECTION DESCRIPTION	FASTENER QUANTITY	TORQUE (N-M/LB-FT)	LIQUID THREAD LOCKER
C-1	CENTER SHAFT KEEPER	2/EA	75/55	MEDIUM STRENGTH (BLUE LOCTITE 242 OR EQUIVALENT)
C-3	ADJUSTABLE DOWN STOP JAM NUT	2/EA	40/30	MEDIUM STRENGTH (BLUE LOCTITE 242 OR EQUIVALENT)
C-4	ADJUSTABLE UP STOP JAM NUT	2/EA	40/30	MEDIUM STRENGTH (BLUE LOCTITE 242 OR EQUIVALENT)
C-5	UPPER & LOWER HINGE PIN KEEPER SCREWS	4/EA	36/26	NOT REQUIRED (A)
C-6	UPPER & LOWER ROLLER KITS	4/EA	339/250	MEDIUM STRENGTH (BLUE LOCTITE 242 OR EQUIVALENT)

6.12 Periodic Maintenance

6.12.1 Weekly Maintenance

- Inspect leg rollers, center pivot pins and bushings, leg hinge pins and bushings for wear or damage. Repair or replace as necessary.
- Inspect machine for loose or broken fasteners. Repair or replace as necessary.
- Inspect labeling. If any label is damaged or otherwise illegible contact the manufacturer for replacement labels.

6.12.2 Monthly Maintenance

- Apply a dry PTFE lubricant to non-greased pivot points or rollers.
- Inspect the appearance of the hydraulic fluid in the HPU. The fluid should be transparent and clear of debris, not cloudy and have no burnt smell. Based on appearance, and/or smell, replace fluid if as necessary. See **Replacing Hydraulic Fluid** section.
- Inspect all hydraulic hoses, fittings and cylinders (including mounts and bushings). Repair or replace as necessary.
- Inspect all electrical wiring and connections. Repair or replace as necessary.
- Inspect limit switches and verify they are operating correctly. Repair, replace, or adjust as necessary.
- Inspect control switch and cord. Repair or replace as necessary.
- Inspect hydraulic power unit for signs of damage or leaks.
- Inspect the hydraulic cylinders and hoses between the cylinders and the hydraulic power unit. If excessive fluid exists in the vent line, the cylinder may need to be repacked or replaced.
- Inspect top and bottom cylinder mounts for wear, including bushings.



TECH SHEET

Technical Tips To Help You And Your Customers

STRUCTURAL

TECH SHEET NO. S-13

DATE ISSUED 12/29/98

DATE REVISED 04/6/15

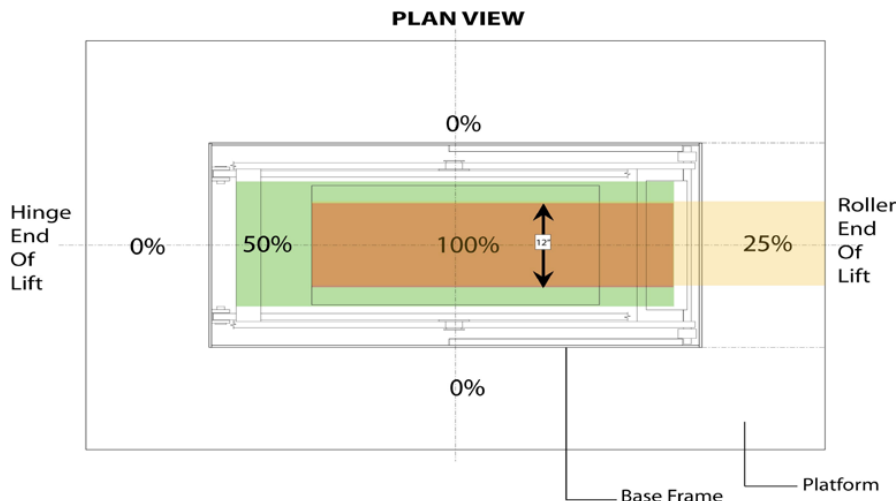
UNDERSTANDING OFF-CENTER LOADING

End and side axle load ratings on scissors lifts are static ratings. The ratings are based on the lift sustaining the load while the lift is static (not moving). The ratings are not intended to be applied to a lift that is dynamic [raising or lowering]. This paper deals with the considerations of off-center or eccentric loads that are on the lift while it is moving.

Scissors lifts react poorly to eccentric or off-center loads that are on the platform while the lift is moving. The enormous stresses introduced into the legs by off-center loads will dramatically shorten the life of the components and the condition will raise the long-term maintenance costs. It is somewhat comparable to loading all the passengers on one side of a bus and driving 100,000 miles. All the components on loaded side will wear at a highly accelerated rate. In extreme cases, the scissors legs will not continue to track straight and wear patterns can even worsen, further provoking the wear and the damage.

Off-center loads to the side* of the platform are much more of a problem than loads on the end** of the platform. This is because of the nature of the scissors leg assembly. The load on the ends of the legs puts them in bending and the legs proportionately share the load. Side loads also create bending, but the load is not shared and any resulting give or deflection in the leg assembly, relative to the opposite leg assembly, causes the entire leg set to track and run out-of-square.

Understand that all loads, regardless of their overall size or shape, have a c/g (center of gravity). Where that c/g is positioned is critical. Therefore, wherever possible, loads (c/g) should be centered over the baseframe both in width and in length. When eccentric loads are absolutely unavoidable, they should be limited to no more than the values shown on the chart below.



This chart illustrates the extreme limits of where a load's c/g could be placed on a lift.

The percentages indicate how much of the lift's rated capacity could be in that zone.

For example, if a lift had a 2,000 lbs. lifting capacity rating, the c/g of a 2,000 lbs. load must remain in the darkest shaded area. If the c/g of a load were to be placed in the 25% shaded area the maximum load must be reduced to 500 lbs. (25% of 2,000 = 500).

Many times an off-center load can be "equalized" by a simple counterweight. For example, the offset weight of the drive on a powered roller conveyor can be equalized or centered over the baseframe of the lift with a counterweight attached to the lift platform.

Our foremost concern with any application is the safety of personnel working around the lifting equipment. We also want the lift to provide long service and require little maintenance. These are values synonymous with the Southworth name. Eccentric load conditions must be reviewed by Southworth prior to the quotation/sale.

* The side of the lift platform is the edge that is parallel to the scissors legs.

** The end of the lift platform is the edge that is perpendicular to the scissors legs.

6.14 Ordering Replacement Parts

Southworth has carefully chosen the components in your lift to be the best available for the purpose. Replacement parts should be identical to the original equipment. Southworth will not be responsible for equipment failures resulting from the use of incorrect replacement parts or from unauthorized modifications of the machine.

Southworth will gladly supply you with replacement parts for your Southworth lift. With your order, please include the model number and the serial number of the lift. You can find these numbers on the name plate. When you are ordering parts for a cylinder, also include the cylinder number. This is stamped on the base of the cylinder housing.

To order replacement parts, please call the Parts Department.

- Parts are shipped subject to the following terms:
- FOB factory
- Returns only with the approval of our parts department.
- Payment net 30 days (except parts covered by warranty).
- Freight collect (except parts covered by warranty).
- The warranty for repair parts is 30 days from date of shipment.

Parts replaced under warranty are on a “charge-credit” basis. We will invoice you when we ship the replacement part, then credit you when you return the worn or damaged part, and we verify that it is covered by our warranty. Labor is not covered under warranty for Parts orders.

7 TROUBLESHOOTING

Before determining a course of action to repair, verify that the DIP switches in the control box are in the proper position according to the electrical functional description. **{Standard}**

When attempting to inspect/troubleshoot and/or repair electrical, hydraulic or structural problems, keep in mind the following:

DANGER

High voltage can cause severe injury or death. Disconnect and lockout electrical power before performing maintenance or repair. In the event of a malfunction, disconnect and do not return to service until the cause of the malfunction has been determined and remedied. See Electrical section and Wiring diagram.

High pressure fluids can penetrate skin and cause severe injury or death. Always relieve hydraulic system pressure before performing maintenance or repair of the hydraulic system. See Relieving Hydraulic System Pressure section.

Never enter beneath the platform unless the machine is unloaded and secured against lowering using the maintenance device(s). See Engaging Maintenance Device(s) section.

Contact Customer Service when in doubt about servicing this lift table.

A substantial number of feature and function combinations exist when custom equipment is provided by a manufacturer. Images illustrated throughout this manual are only representative samples of designs that may or may not exist in the machine this general manual was provided for. When questioning whether any part of this manual applies specifically to your machine, you may contact customer service with your order number and/or the serial number for your machine, and we will provide the specific drawing(s) that combined with this manual will provide sufficient information to install, test, operate and maintain the equipment.

For any hydraulic fluid losses, see Replacing Hydraulic Fluid and Hydraulic Fluid sections.

For any changes to the down speed, see the Adjusting Down Speed Flow Control Valve section, if so equipped.

Compare images in the Compact Control Box and Standard Control Box sections to determine which has been provided with this lift table. **{Standard}**

For intermittent motor run time and maximum number of starts per hour, see Thermal Overload Protection section.

Problem	Possible Cause	Check
Lift will not raise	LED status of control box is not green {Standard}	Verify the LED status code to troubleshoot. If the configuration was changed (ie a limit switch etc. was added and/or a DIP switch was toggled), the power will need to be cycled to off and on again. {Standard}
	Load too heavy	Verify load does not exceed the rated capacity.
	Power unit not receiving power	Check that wiring and any associated fusing is intact, connections are tight, and that there are no blown fuses.
	3-phase motor may be rotating in wrong direction	Verify motor direction. If motor is rotating in wrong direction, swap any two phases of the supply power leads.
	Operator controls may be malfunctioning or may not be receiving power	Check that wiring and any associated fusing is intact, connections are tight, and that there are no blown fuses.
	Motor contactor may be malfunctioning	Verify motor contactor is functioning. Replace as necessary.
	Hydraulic fluid low	Add fluid if necessary. Do not overfill.
	Motor voltage low	Supply voltage must be $\pm 10\%$ of the rated voltage at the motor terminals for 3-phase voltages, and 5% of the rated voltage at the motor terminals for 115v single phase voltage. 1 HP, 115/1/60 motors to be on dedicated 20 amp circuits.
	Suction strainer clogged	If suction strainer is clogged, contact Customer Service for assistance.
	External hydraulic leak	Inspect all hoses and fitting for damage. Verify all fittings are tight.
	Down valve may be energized	Check down valve solenoid using a multimeter. Down valve should not be energized when raising the lift.
	Pressure relief valve is activated	A unusual squealing noise may indicate the pressure relief valve is activated. Contact Customer Service for assistance.
	Mechanical obstruction	Ensure lifting eyes are removed. Check to make sure nothing else is preventing the lift from moving.
	Motor thermal overload or overload relay tripped	Verify load does not exceed the rated capacity and there are no obstructions preventing raising of the platform. Take note of the number of motor starts or the actual motor run time per hour. Excessive motor starts or run time may indicate that an intermittent duty motor is not sufficient for this application. See Thermal Overload Protection section. Contact Southworth customer service.
	Up limit switch is triggered or malfunctioning	If the limit switch is triggered and it is expected the platform should be higher, see Adjusting Limit Switches and Hard Stops {Standard} or Adjusting Limit or Proximity Switches {Classic} sections. If up limit switch is malfunctioning, replace.

Problem	Possible Cause	Check
Lift will not raise	Motor windings set incorrectly for the primary power being supplied	Confirm both the primary power and the windings. Contact Customer Service for assistance.
Lift raises too slowly	LED status of control box is not green {Standard}	Verify the LED status code to troubleshoot. {Standard}
	Load too heavy	Ensure load does not exceed the rated capacity.
	Voltage may be low	Supply voltage must be $\pm 10\%$ of the rated voltage at the motor terminals for 3-phase voltages, and 5% of the rated voltage at the motor terminals for 115v single phase voltage.
	Suction strainer or pressure line may be clogged	If suction strainer is clogged, contact Customer Service for assistance.
	Motor windings set incorrectly for the primary power being supplied	Confirm both the primary power and the motor windings. Contact Customer Service for assistance.
Lift not stopping at UP limit switch	DIP Switch setting is not set correctly {Standard}	Check to make sure MAINTENANCE BYPASS DIP switch is off for the compact control box. {Standard} Check to make sure UP LIMIT SWITCH DIP switch is on for standard control box. {Standard}
	Maintenance bypass switch is turned on	Check to ensure that maintenance bypass switch is off.
	LED status of control box is not green {Standard}	Verify the LED status code to troubleshoot. {Standard}
Lift will not stay elevated. (Drifts down)	Some drift is normal	ANSI MH29.1 Allows for 0.5% of the maximum vertical travel of the platform over a period of 15 minutes.
	Down valve may be leaking internally	Remove the down valve and inspect for debris which may be preventing it from closing. The lift table should be properly secured before removing the down valve. See Engaging Maintenance Device(s) section.
	Load holding check valve may be leaking internally	Contact Customer Service.
	Down valve may be energized	Check the solenoid with a volt meter.
	Hydraulic leak	Check for fluid leaks.
	Cylinders may be leaking internally	Check vent lines for excess fluid or signs of external leakage.

Problem	Possible Cause	Check
Lift will not lower	LED status of control box is not green {Standard}	Verify the LED status code to troubleshoot. If the configuration was changed (ie a limit switch etc. was added and/or a DIP switch was toggled), the power will need to be cycled to off and on again. {Standard}
	Maintenance device(s) may be engaged	Check to make sure that the maintenance device(s) is(are) in its(their) storage location(s).
	Down valve may not be energized	Check for power to the solenoid valve with a volt meter while pressing the down button.
	Adjustable down speed flow control valve (if equipped) may need to be adjusted	Adjust down speed flow control valve as needed.
	Lift may be mechanically bound	Inspect machine for debris or damage that may prevent the machine from lowering.
Lift lowers too slowly	LED status of control box is not green {Standard}	Verify the LED status code to troubleshoot. {Standard}
	Down valve may not be fully opening or may be partially blocked or stuck closed.	Remove the down valve, inspect and clean.
	Down speed flow control valve may need to be adjusted	Adjust the down speed flow control valve as necessary.
Lift lowers too quickly	LED status of control box is not green {Standard}	Verify the LED status code to troubleshoot. {Standard}
	Adjustable down speed flow control valve (if equipped) may need to be adjusted	Adjust down speed flow control valve as needed.

8 ELECTRICAL

Our electrical wiring diagrams/schematics may be found in the **Appendix** section. Our electrical functional diagrams (EFD) are unique to each machine and will be inserted into the control box as shipped from the factory to be specifically intended for the machine it is placed into. **{Standard}** The EFD describes the control features of the lift table and is used to determine which elements of the electrical wiring diagram apply. The EFD illustrated in the **Electrical Functional Description** section represents an example of general information that could be found in the actual EFD of the machine the manual represents. As illustrated in this manual, it is not intended to represent a specific machine.

NOTICE

⋮
⋮ **There should be an electrical functional diagram (EFD) inserted into the control box of this machine. For internal hydraulic power units, it will be necessary to engage the maintenance device(s) before retrieving this document from the control box.**
⋮ **Contact customer service if not found.**
⋮

All machines will be labeled with their primary and control power ordered, contact Customer Service if you have any questions.

8.1 Maximum Motor Current Load {Standard}

The chart below provides insights into the full load amps of the common motors supplied on these lift tables. Other electrical features for specific lift table may include additional loading, but in general, the motor load will comprise the majority of the power required. Always check the data plate on the motors for full load amps at the given primary voltage. Contact Customer Service if you have questions or if the lift table is equipped with motors not represented here.

PRIMARY POWER	Phase	HZ	HP	KW	FULL LOAD AMPS (MOTOR ONLY)
115	1	60	1	0.75	10.3
230	1	60	1	0.75	7.3
208	3	60	1	0.75	4.0
230	3	60	1	0.75	5
460	3	60	1	0.75	2.5
208	3	60	3	2.2	9.1
230	3	60	3	2.2	9.1
460	3	60	3	2.2	4.7
115	1	50	1	0.75	9.5
230	1	50	1	0.75	5.0
230	3	50	1	0.75	9.5
400	3	50	1	0.75	2.9
230	3	50	3	2.2	14.2
400	3	50	3	2.2	5.4

8.2 Maximum Motor Current Load {Classic}

The chart below provides insights into the full load amps of the common motors supplied on these lift tables. Other electrical features for specific lift table may include additional loading, but in general, the motor load will comprise the majority of the power required. Always check the data plate on the motors for full load amps at the given primary voltage. Contact Customer Service if you have questions or if the lift table is equipped with motors not represented here.

PRIMARY POWER	Phase	HZ	HP	FULL LOAD AMPS (MOTOR ONLY)
115	1	60	1	17
230	1	60	1	8.5
115	1	60	1.5	17
230	1	60	1.5	8.5
115	1	60	3.2	27
230	1	60	3.2	13.5
208	3	60	1	6.6
230	3	60	1	6.0
460	3	60	1	3.0
208	3	60	3.2	8.4
230	3	60	3.2	8.0
460	3	60	3.2	4.0

8.3 Thermal Overload Protection

Our standard intermittent duty motors are able to run for a maximum 15 minutes per hour. The number of motor starts in a given hour to be no more than 100. The number of motor starts in a given minute to be no more than 4 for single-phase and no more than 5 for 3-phase. If the motor is being run for more than 15 minutes per hour or an excessive number of starts are occurring, the thermal overload within the motor **{Standard or Classic}** or the overload relay at the control panel **{Classic}** could automatically stop the motor to allow it to cool down before any damage to it can occur. This result is normal but if this situation happens multiple times, the application may require a different duty type of motor. Motor thermal overload and/or overheating can also be caused by low voltage being supplied to the motor versus the motor requirement, typically 10% low on 3-phase and 5% or more low on single-phase motors especially at initial motor start up inrush. In general, 3-phase motor voltage needs to be within +/- 10% of rated voltage and single-phase motor voltage needs to be within +/- 5% of rated voltage.

8.4 Electrical Functional Description (SAMPLE ONLY) {Standard}

The EFD may be found inside the control box.

8.4.1 Controls

- Press and Hold [Standard] - The machine functions only while control buttons are being depressed.
- Press and Release [Maintained Contact] - An E-STOP is required. After a control button is pressed, the machine functions until a limit is reached or the E-STOP is activated.
- E-Stop - An emergency stop is provided to open the control circuit to prevent all electrical machine functionality.

8.4.2 Elevation Limit Switches

- None - The elevation is not limited electrically.
- Up - Stops the lift at the raised height and disables the operator “Up” control while engaged.
- Down - Deenergizes the down valve solenoid at the fully lowered height and disables the operator “Down” control while engaged.

8.4.3 Motors

- Lift (Single Acting) - The lift power unit motor is powered while raising.

8.4.4 Valving

- Lift Down Valve - The lift’s “Down” valve (normally closed) is energized open while lowering.

8.4.5 Control Box Configurations

Standard Box DIP Switch Settings

(see **Standard Control Box** and **Compact Control Box** sections to identify)

1. OFF (PRESSURE SWITCH)
2. OFF (GENERAL STOP)
3. **ON (LOWER LIMIT SWITCH)**
4. **ON (UPPER LIMIT SWITCH)**
5. OFF (VALVE 2 UP/DOWN)
6. OFF (VALVE 2 UP & DOWN)
7. **ON (MAINTAINED UP)**
8. **ON (MAINTAINED DOWN)**
9. NOT USED

Compact Box DIP Switch Settings

1. **ON (UPPER LIMIT SWITCH)**
2. **ON (LOWER LIMIT SWITCH)**
3. OFF (TOE GUARD)
4. OFF (SECONDARY VALVE)
5. **ON (MAINTAINED UP)**
6. **ON (MAINTAINED DOWN)**
7. OFF (MAINTENANCE BYPASS)
8. OFF (AUXILIARY)

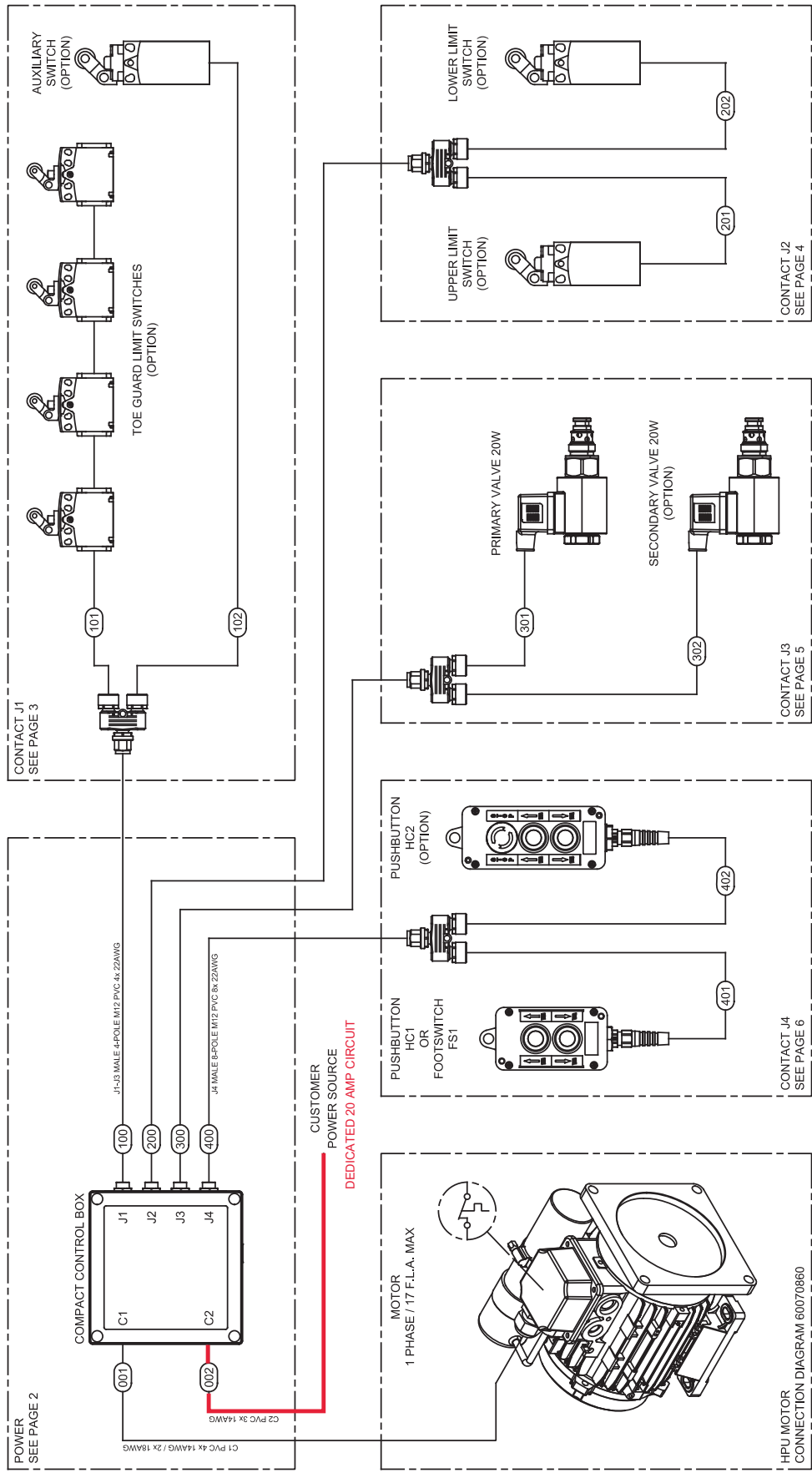
(NOTE: The configurations listed above are shown only to illustrate that each control box has different DIP switch arrays, these would never be shown together as only one is used per lift.)

8.5 Wiring Diagram Reference [60070711, 60065342 & 60078722] {Standard}

To determine how to connect house power to the control box of the lift table, review the **Wiring Diagram Index** sections and the following table for guidance to find the respective pages you will need to install your lift table. These drawing pages may be referenced in the **Appendix** section of this manual. The actual drawing number can be confirmed on the actual control box of the lift table.

Primary Voltage/ Phase/Hz	Drawing Number	Page Number	Control Box	Notes
115/1/60	60070711	2 of 8	Compact	Fewer options available
460/3/60 380-415/3/50	60065342	2 of 13	Standard	More options available
208-230/3/60 190-230/3/50	60065342	3 of 13	Standard	More options available
115/1/60 230/1/50	60065342	4 of 13	Standard	More options available
208-230/1/60	60065342	5 of 13	Standard	More options available
115/1/60	60078722	1 of 4	Relay	Fewer options available No DIP switches included

8.6 Wiring Diagram Index [60070711] (115/1/60 Power Only, Comp Control Box) {Standard}



CUSTOMER RESPONSIBLE FOR PROVIDING ALL WIRING BETWEEN CUSTOMER POWER SOURCE AND C2 AT COMPACT CONTROL BOX.
 CONDUCTOR LENGTHS NEEDED AND LOCAL ELECTRICAL CODES DICTATE SIZING AND TYPE OF CONDUCTORS REQUIRED, EXCEPT FOR 115/1/60 CORDS WITH PLUG.

POWER
SEE PAGE 2

CONTACT J1
SEE PAGE 3

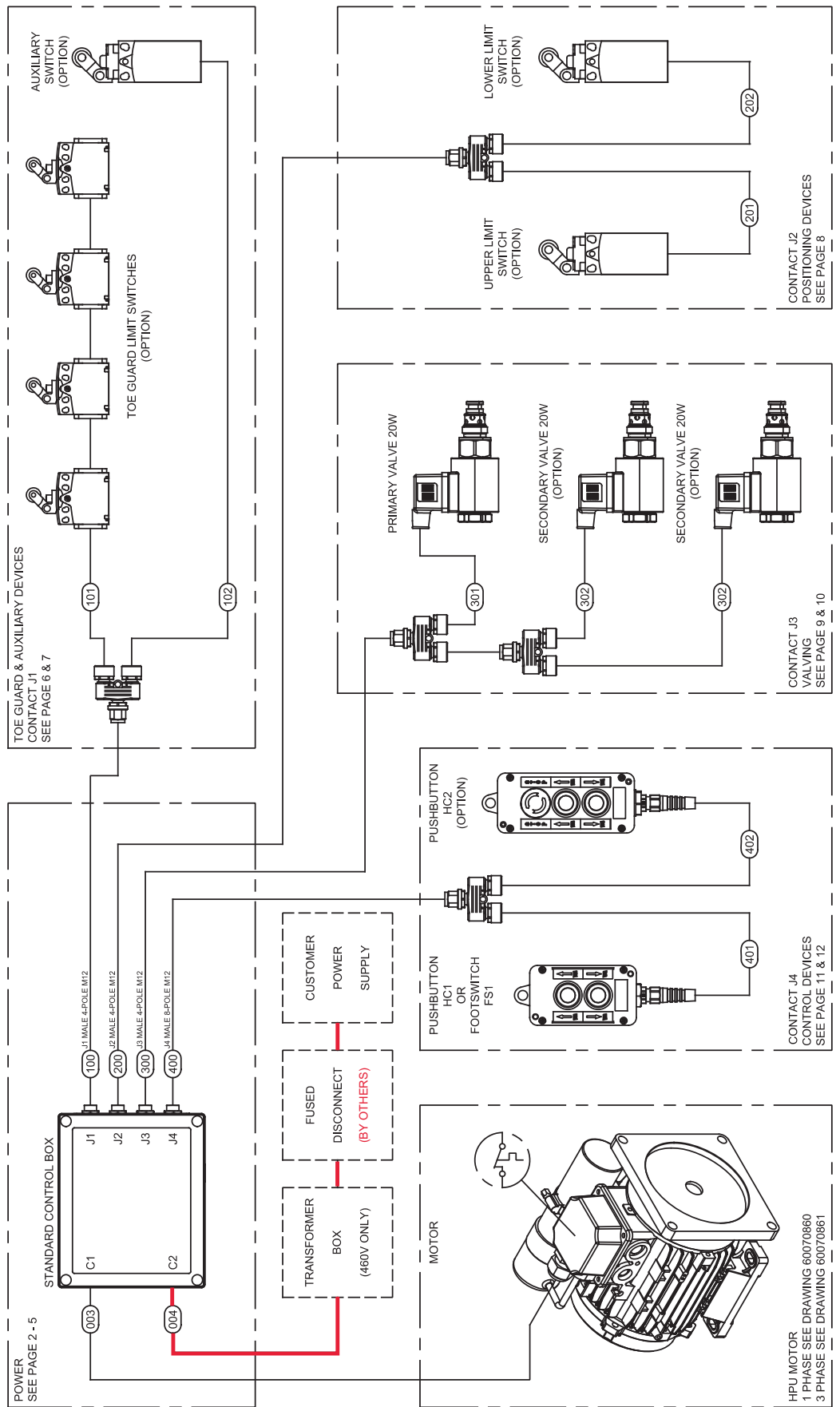
CONTACT J2
SEE PAGE 4

CONTACT J3
SEE PAGE 5

CONTACT J4
SEE PAGE 6

HPU MOTOR
CONNECTION DIAGRAM 60070860

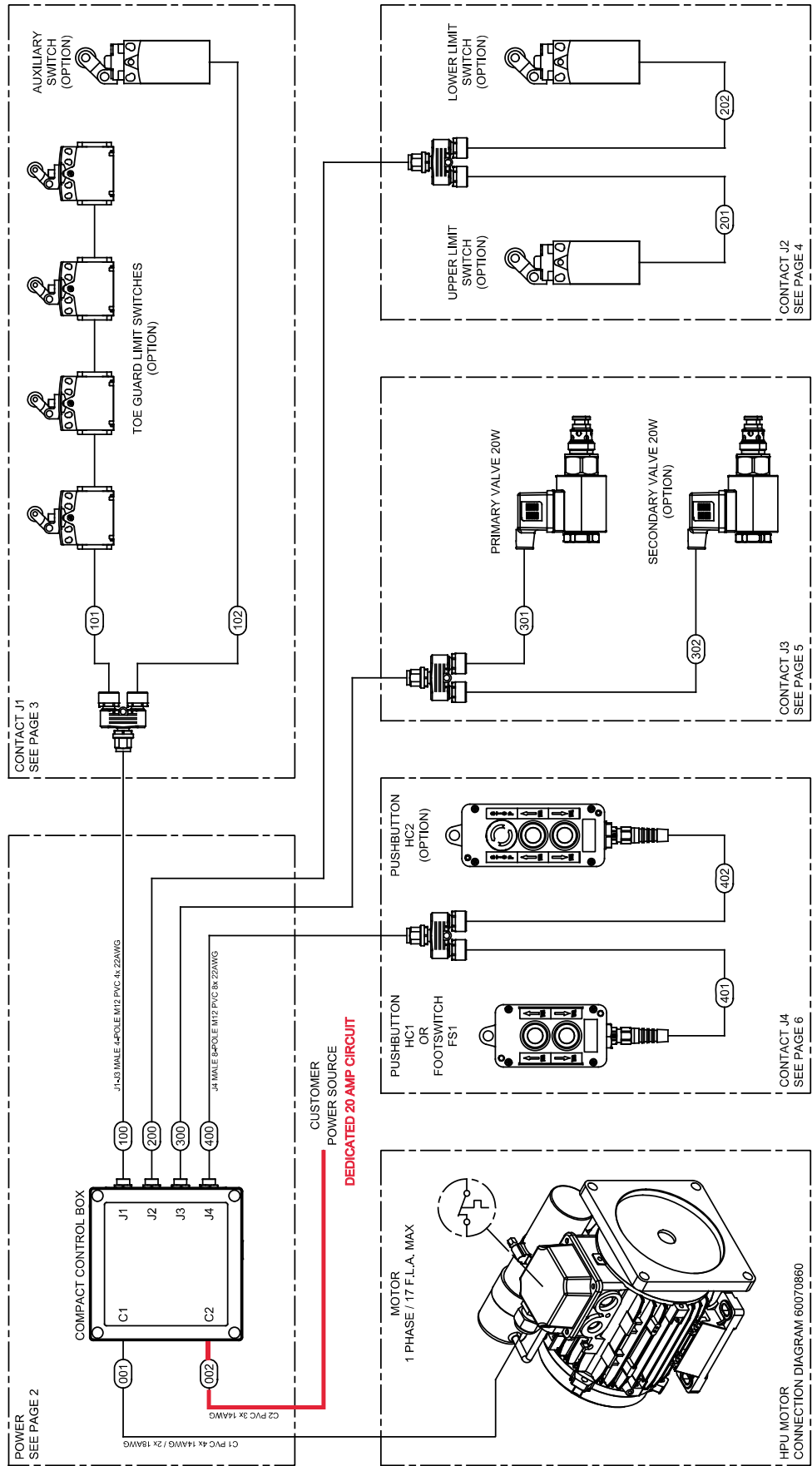
8.7 Wiring Diagram Index [60065342] (All Power Options, Standard Control Box) {Standard}



CUSTOMER RESPONSIBLE FOR PROVIDING ALL WIRING BETWEEN CUSTOMER POWER SOURCE AND C2 AT STANDARD CONTROL BOX.
A 460/3/60 TRANSFORMER BOX (REQUIRED FOR 460/3/60 PRIMARY POWER) MUST BE PURCHASED THROUGH US.
CONDUCTOR LENGTHS NEEDED AND LOCAL ELECTRICAL CODES DICTATE SIZING AND TYPE OF CONDUCTORS REQUIRED. EXCEPT FOR 115/1/60 CORDS WITH PLUG.

SEE SHEET 13 FOR LED STATUS INDICATOR LEGEND

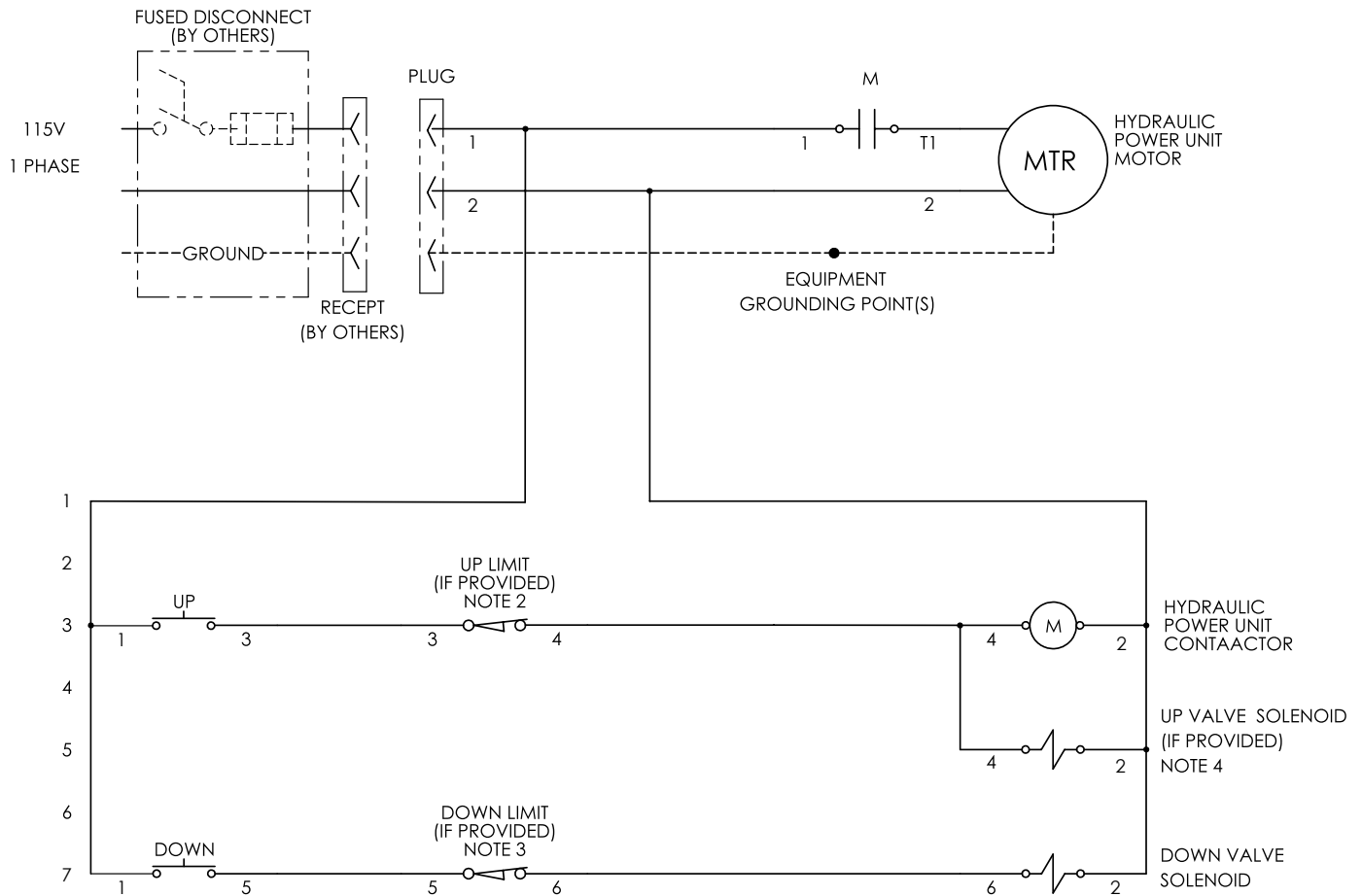
8.8 Wiring Diagram Index [60078722] (115/1/60 Power Only, Control Relay Box) {Standard}



CUSTOMER RESPONSIBLE FOR PROVIDING ALL WIRING BETWEEN CUSTOMER POWER SOURCE AND C2 AT COMPACT CONTROL BOX. CONDUCTOR LENGTHS NEEDED AND LOCAL ELECTRICAL CODES DICTATE SIZING AND TYPE OF CONDUCTORS REQUIRED, EXCEPT FOR 115/1/60 CORDS WITH PLUG.

HPU MOTOR CONNECTION DIAGRAM 60070860

8.9 Typical Single Phase Electrical Schematic {Classic}

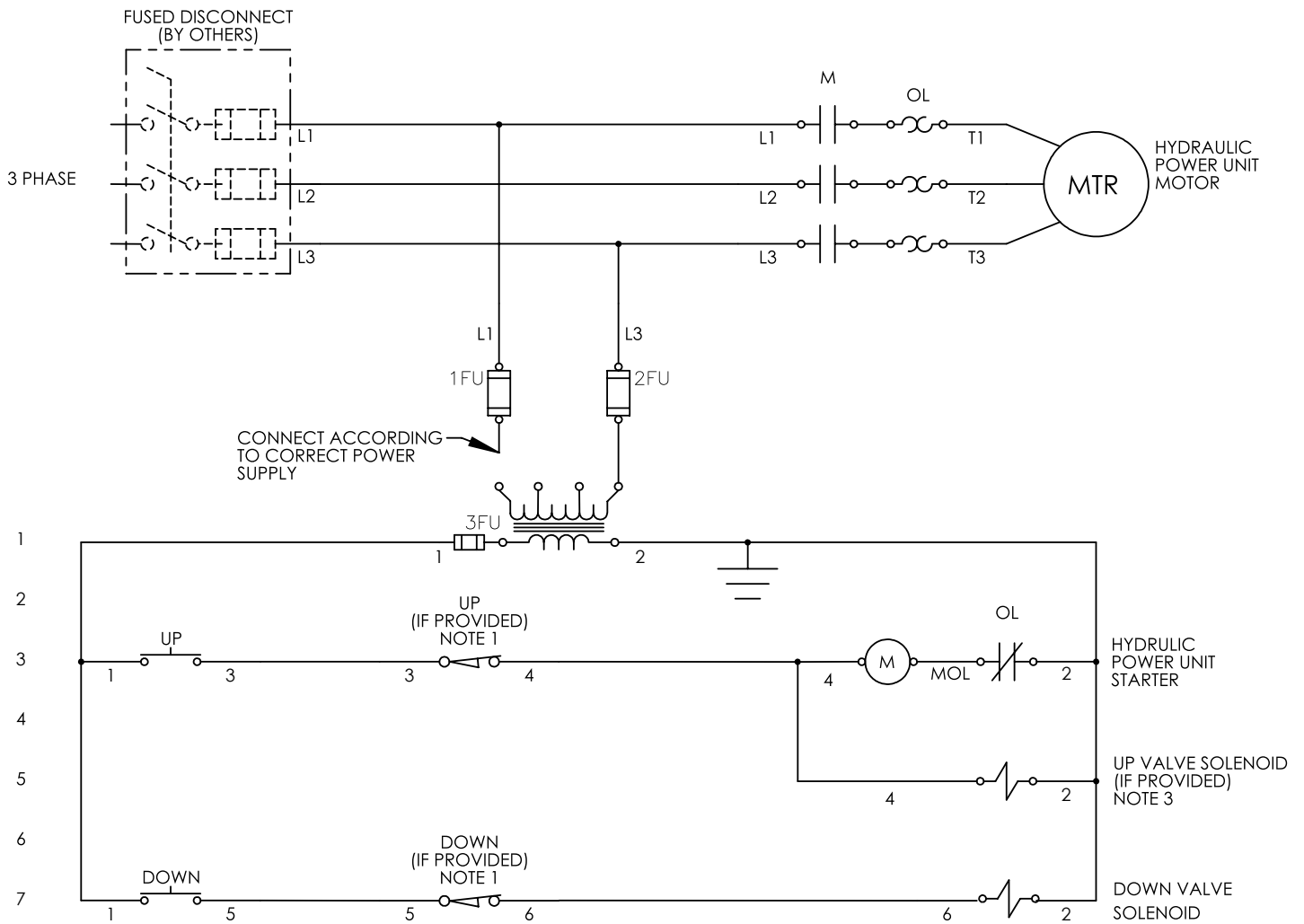


NOTES:

1. ALTHOUGH PUSHBUTTONS ARE SHOWN, FOOTSWITCHES MAY BE USED.
2. IF AN UP LIMIT SWITCH IS NOT PROVIDED, WIRE 3 CONNECTS TO THE MOTOR CONTACTOR IN PLACE OF WIRE 4.
3. IF A DOWN LIMIT SWITCH IS NOT PROVIDED, WIRE 5 CONNECTS TO THE DOWN VALVE SOLENOID IN PLACE OF WIRE 6.
4. IF PROVIDED, AN "UP" VALVE SOLENOID MAY BE CONNECTED IN PARALLEL WITH THE MOTOR CONTACTOR AS SHOWN.

**(IF YOUR SYSTEM APPEARS DIFFERENT,
CONTACT CUSTOMER SERVICE FOR
SPECIFIC SCHEMATIC AND ASSISTANCE.)**

8.10 Typical 3-Phase Electrical Schematic {Classic}



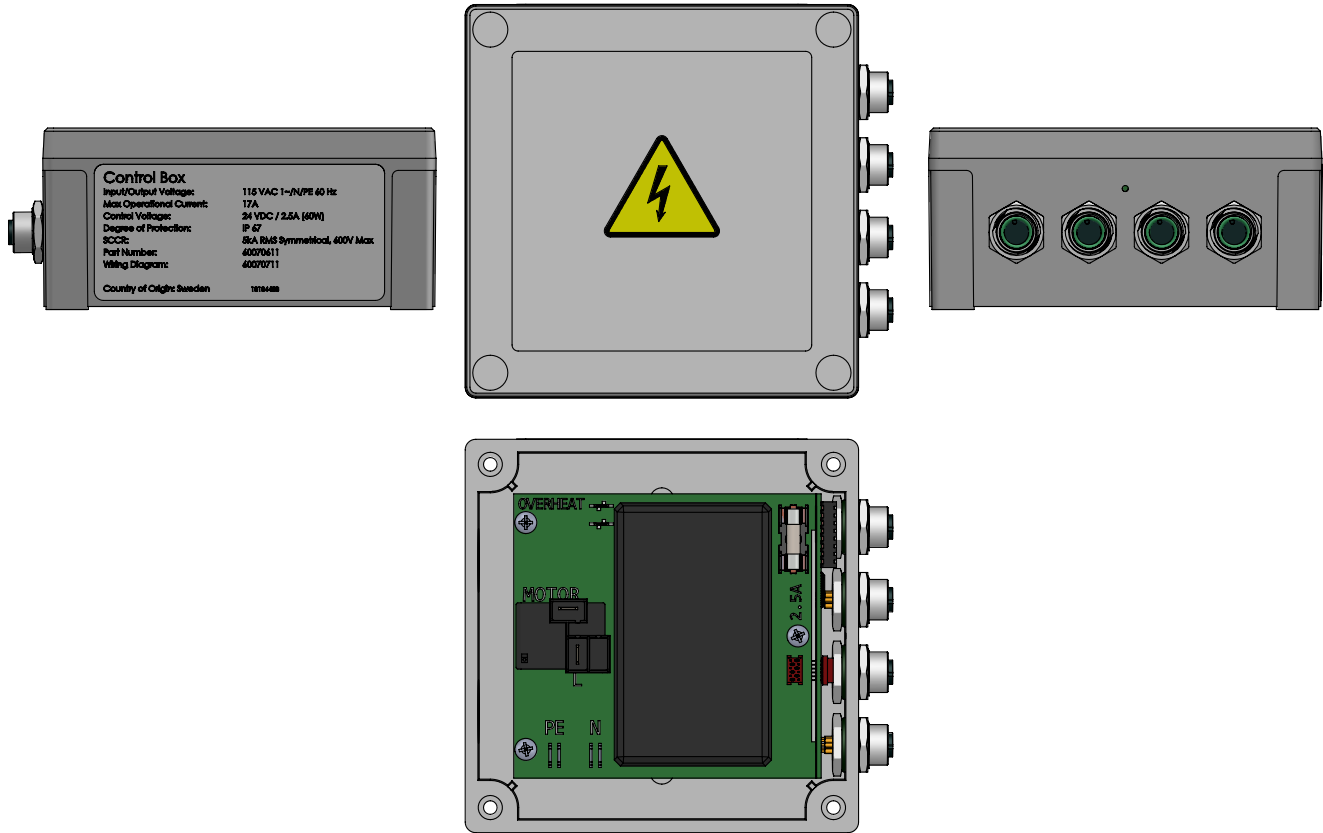
NOTES:

1. FOR ANY LIMIT SWITCH THAT IS NOT PROVIDED WITH THE EQUIPMENT, ADD A JUMPER BETWEEN THE ASSOCIATED TERMINALS.
2. ALTHOUGH PUSHBUTTONS ARE SHOWN, FOOTSWITCHES MAY BE USED.
3. IF PROVIDED, AN "UP" VALVE SOLENOID MAY BE CONNECTED IN PARALLEL WITH THE MOTOR STARTER AS SHOWN.

**(IF YOUR SYSTEM APPEARS DIFFERENT,
CONTACT CUSTOMER SERVICE FOR
SPECIFIC SCHEMATIC AND ASSISTANCE.)**

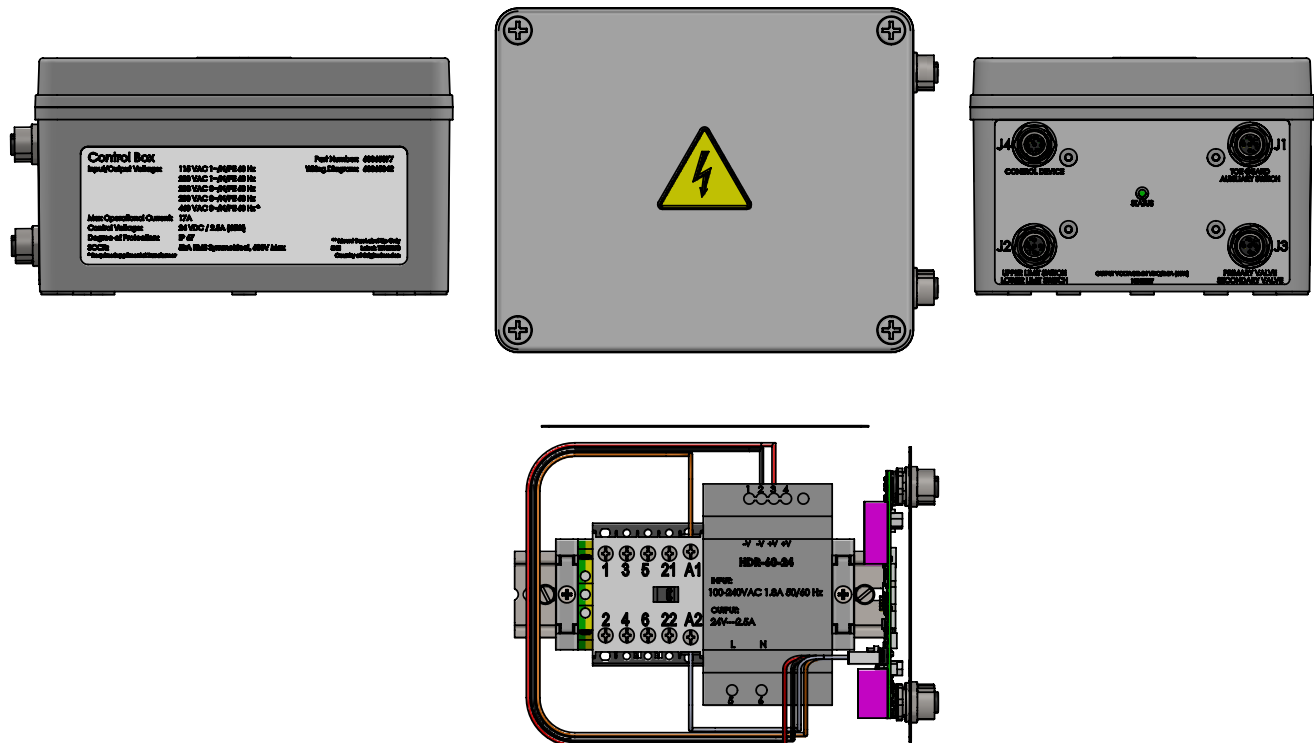
8.11 Compact Control Box {Standard}

Our compact control box is illustrated below.



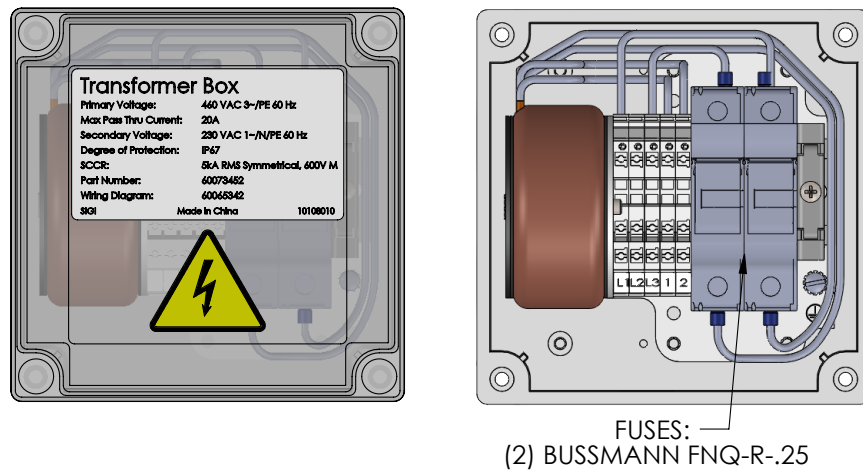
8.12 Standard Control Box {Standard}

Our standard control box is illustrated below.



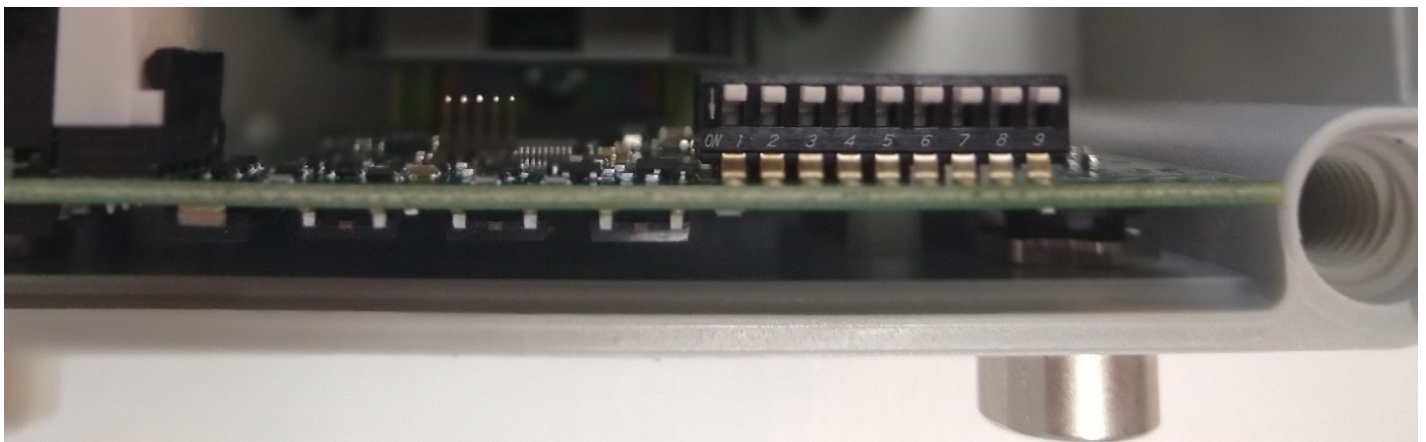
8.14 Transformer Box (for 460/3/60 only) {Standard}

Along with the standard control box, a transformer box would be shipped loose for lift tables ordered with 460/3/60 primary voltage.



8.15 DIP Switch Array {Standard}

There are times when opening the HPU control box may be necessary. If it is necessary to change a DIP switch setting, see a typical representation of the array below. The actual array may look different than that shown below, but will allow you to change settings accordingly based on the **Control Box Configuration** section. In the array below, all switches are off. These are typically set at the factory based on the electrical functional description (EFD) for the lift table. Components may be added in the field if necessary, but would require modifying the EFD and adjusting these DIP switches.

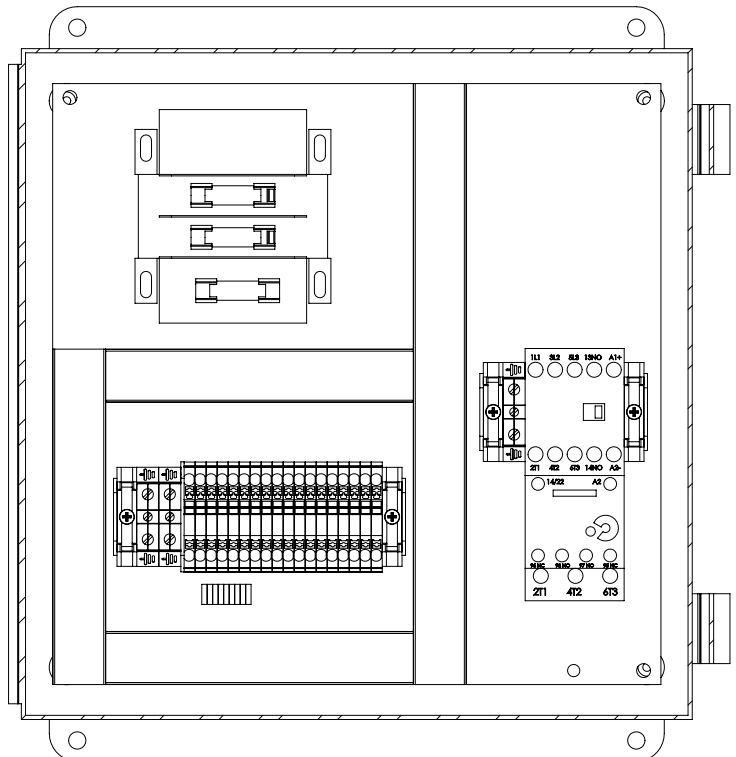
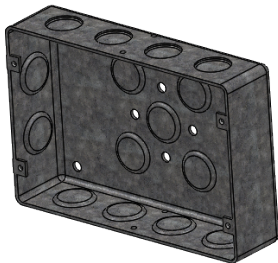
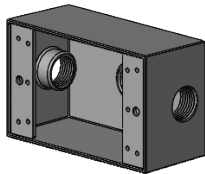
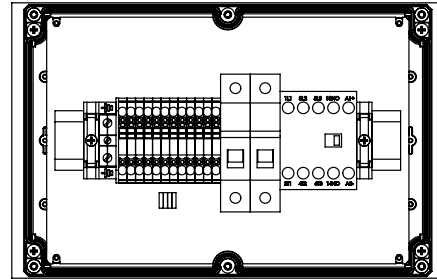
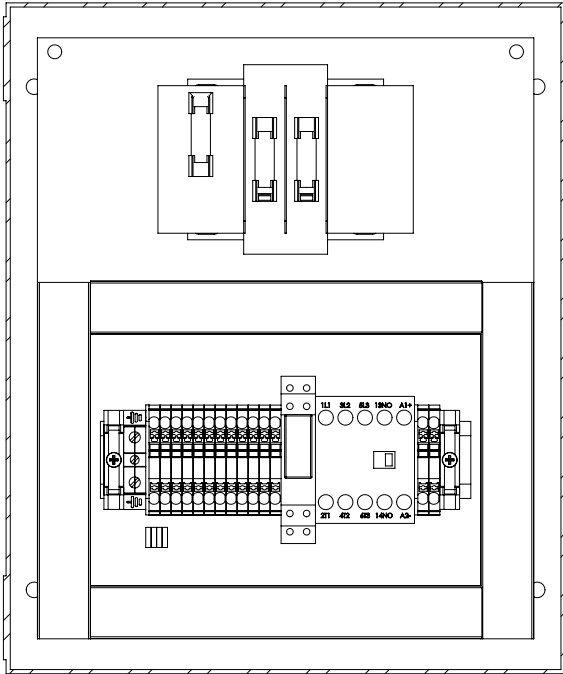


CAUTION

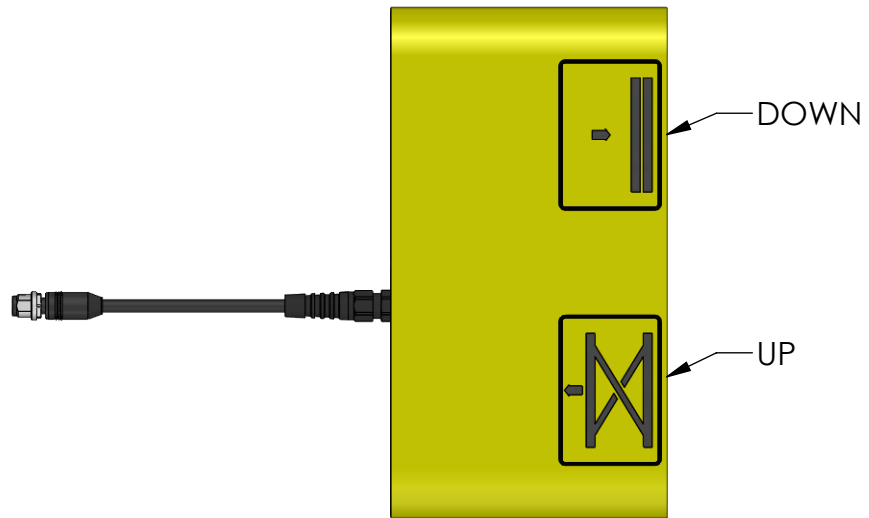
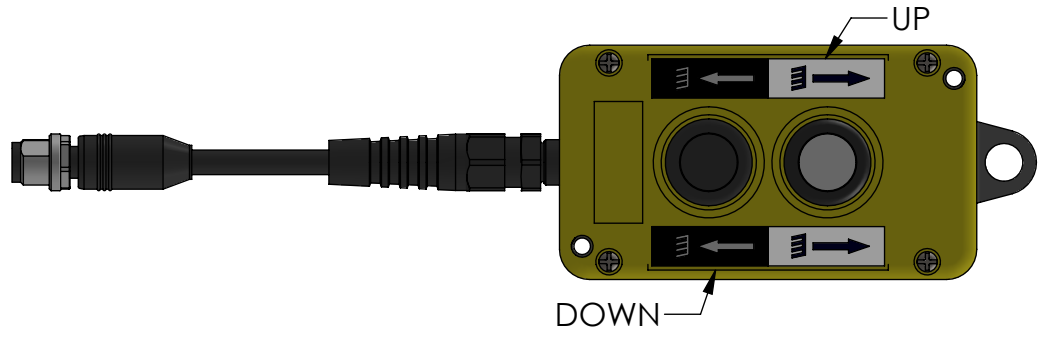
Setting these DIP switches incorrectly versus the EFD may cause unexpected or no operation of the lift table.

Any change in function expected by changing the setting of the DIP switch settings must also be accompanied by additional M12 connections, splitters, cords and accessories such as limit or prox switches, toe guard, etc. that support functionality.

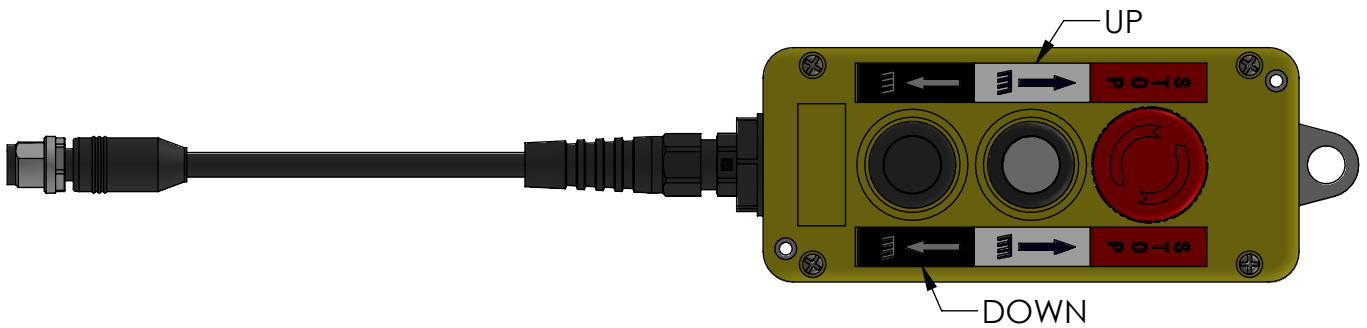
8.16 Typical Control Panels {Classic}



8.17 Standard Controllers



8.18 Optional Controllers



9 HYDRAULICS

9.1 Hydraulic Fluid

If the lift will be used at normal ambient temperatures, Southworth supplies the unit with Citgo AW 32 oil. This may be replaced by any other good quality oil with 150 SSU at 100° F and rust and oxidation inhibitors and anti-wear properties. If the lift will be used at ambient temperatures below 0°F, use Type 15 aircraft hydraulic oil.

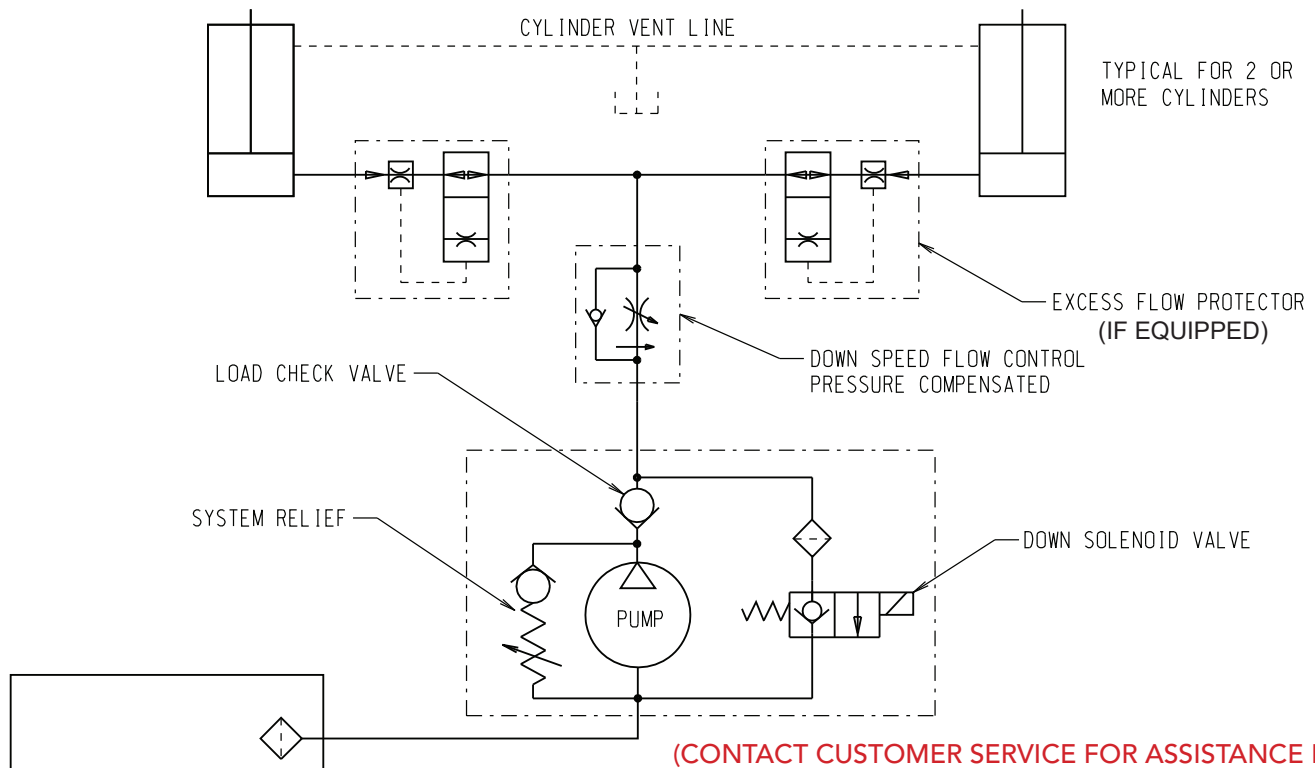
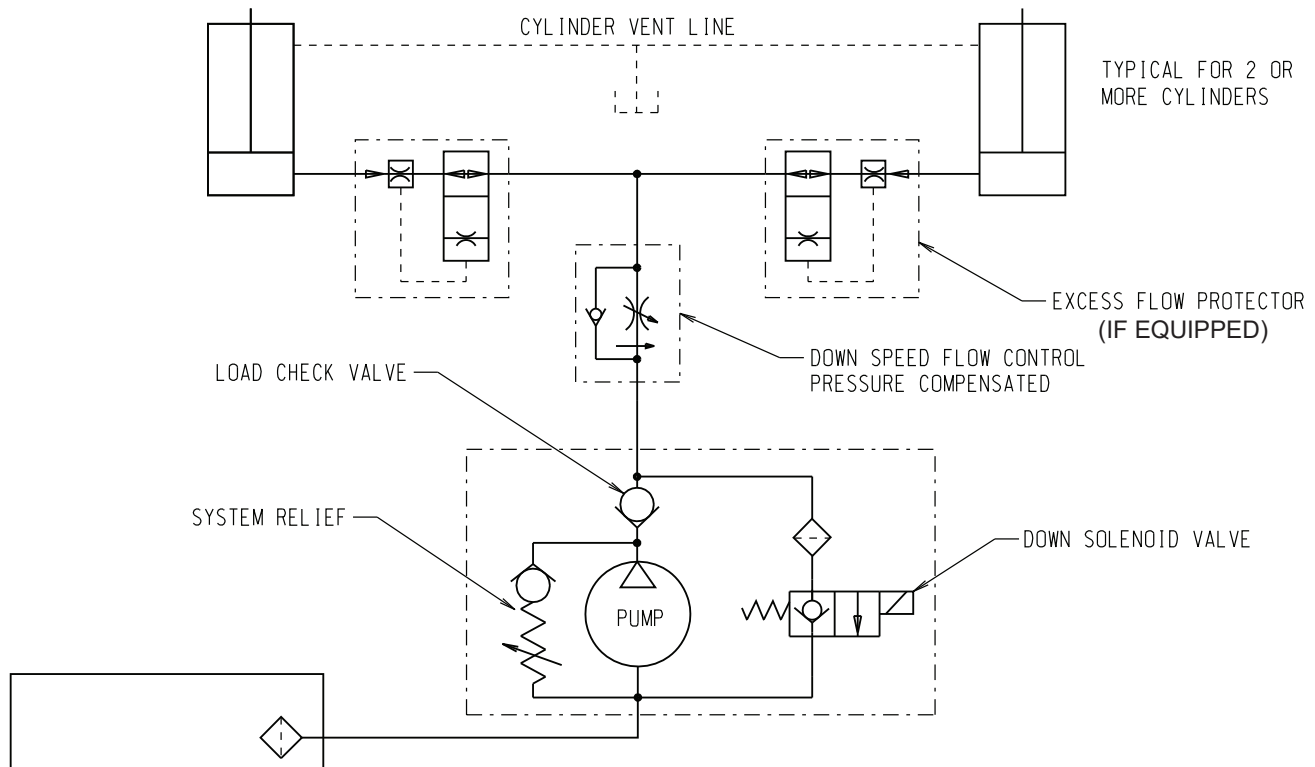
ISO 32 hydraulic oil products equivalents to CITCO AW32 are: Mobil DTE 32, Texaco Rando 32, Shell AW Hydraulic 32, Chevron AW Machine Oil 32, or Exxon Humble Hydraulic 32.

NOTICE

- ⋮
- ⋮ **Some lift tables ship with other fluid types such as food grade, fire resistant, etc.**
- ⋮ **Hydraulic fluid reservoirs are typically labeled accordingly. Contact Customer**
- ⋮ **Service with your serial number if you have any questions.**
- ⋮

9.2 Hydraulic Schematics (Typical)

Cylinder vent lines allow small amounts of residual fluid out of the rod end of the cylinder to return to the reservoir and not end up on the floor. Excessive fluid in these lines is not a normal condition and could be a sign that the cylinders are in need of servicing.



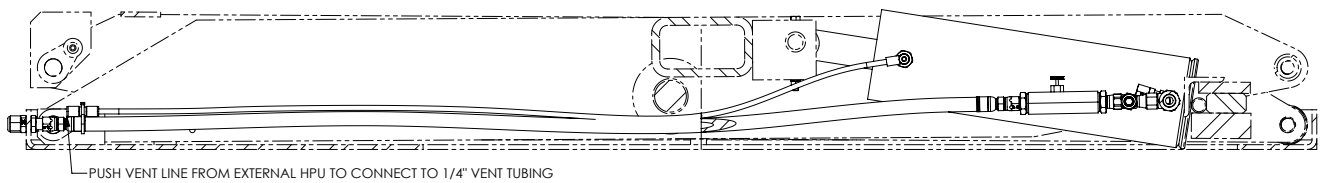
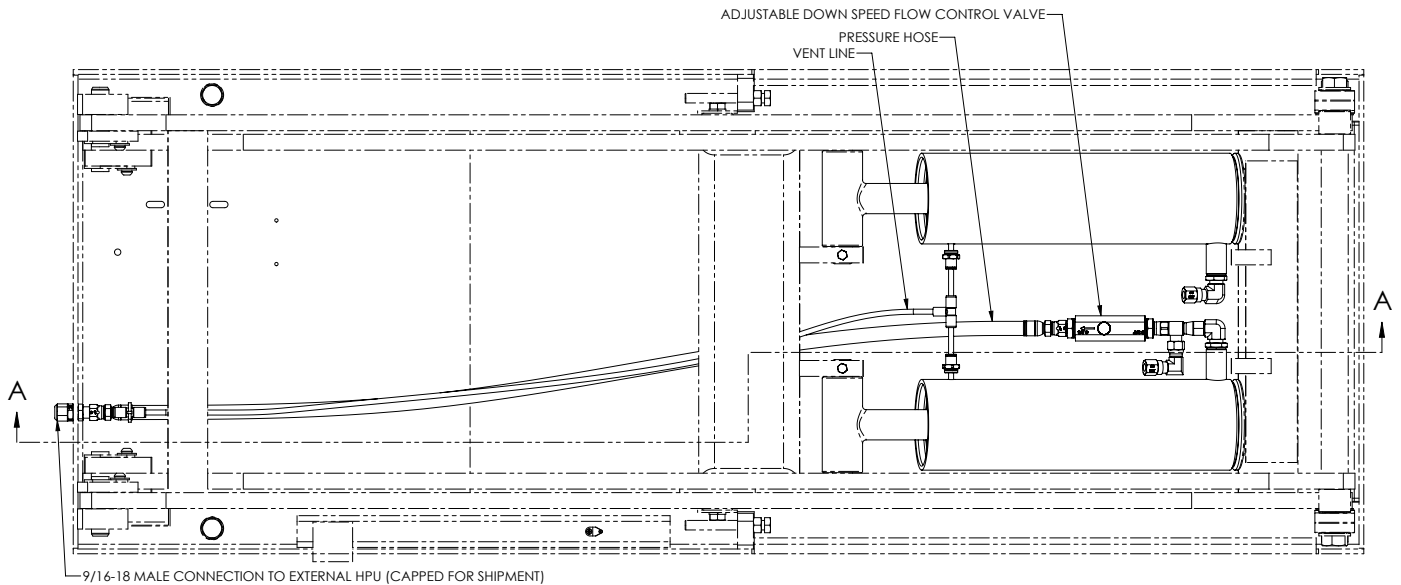
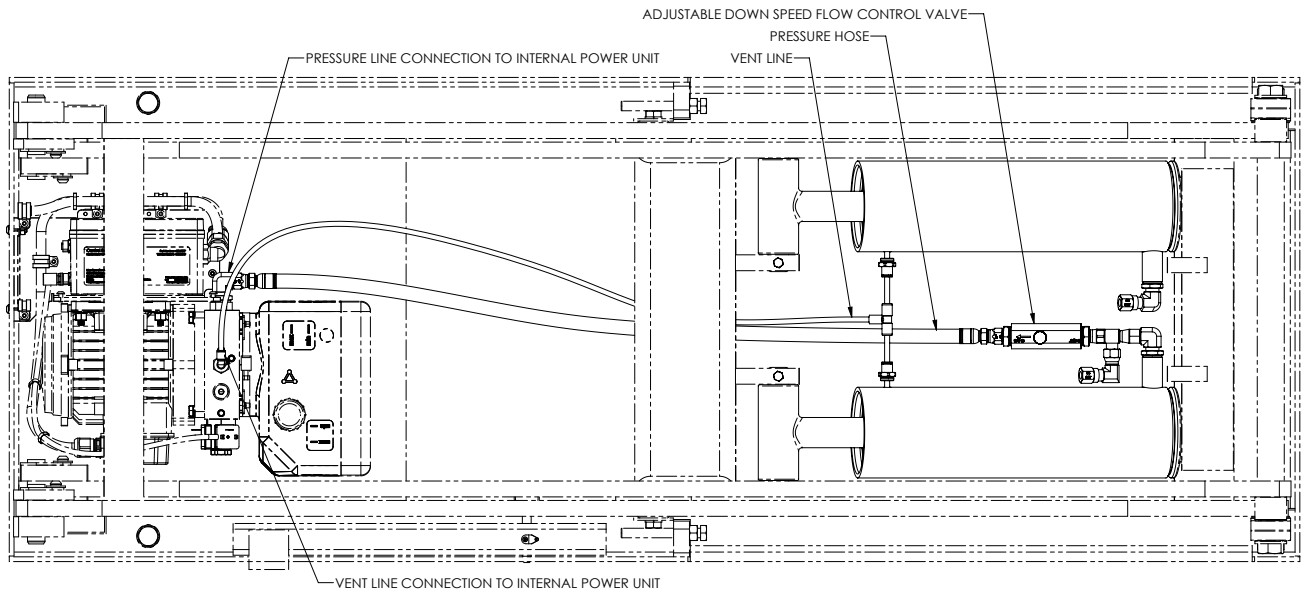
(CONTACT CUSTOMER SERVICE FOR ASSISTANCE FOR DOUBLE ACTING (POWER UP AND POWER DOWN) CYLINDERS OR FOR LIFT TABLES WITH OPTIONS THAT ARE NOT REPRESENTED IN THIS MANUAL.)

9.3 Hydraulic Power Units (Typical Internal/External)

Typical hydraulic power unit images may be found in the **Key Components** section.

9.4 Hydraulic Arrangements (Typical Internal/External HPUs)

Cylinder vent lines allow small amounts of residual fluid out of the rod end of the cylinder to return to the reservoir and not end up on the floor. Excessive fluid in these lines is not a normal condition and could be a sign that the cylinders are in need of servicing.



SECTION A-A

10 WARRANTY & CONTACT INFORMATION

Southworth Products Corp. warrants this product to be free from defects in material or workmanship for the duration of the warranty period. Warranty periods vary and begin on the date of shipment. For specific warranty information, contact Southworth Products with the machine's serial number.

Any claim for breach of this warranty must be received in writing by Southworth within the warranty period. Warranties shall not cover failure or defective operation, caused by misuse, misapplication, negligence or accident, exceeding recommended capacities, or any alteration or repair of the item purchased which has not been authorized by Southworth. Except as set forth herein, Southworth makes no other warranties, express or implied, including THE WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE, all of which ARE HEREBY EXCLUDED.

Southworth's obligations under any warranty or for any other damages which may arise under any sale, agreement, or contract, are limited to the replacement or repair of defective components at its factory or another location at Southworth's discretion. This is buyer's sole remedy under any such warranty, sale, agreement, or contract. Southworth will not be liable for consequential, incidental, exemplary, or punitive damages of any kind resulting from a breach of any warranty that it has provided or for breach of any term of any sale, agreement, or contract. Any warranty may be altered only in writing by Southworth.

Southworth meets the labeling requirements of California's Proposition 65. Southworth makes no warranty or representation with respect to the compliance of any product with other State or local safety or product standard codes and any failure to comply with such codes shall not be considered a defect of material or workmanship under this warranty. Southworth shall not be liable for any direct or consequential damages arising out of such non-compliance.

All commodities, software, or technology purchased from Southworth are subject to the export and re-export control laws and regulations of the United States, including but not limited to the Export Administration Regulations ("EAR") and Department of the Treasury Office of Foreign Asset Controls ("OFAC") Regulations. Southworth expects all distributors and customers to comply with these laws and regulations. Without limiting the foregoing, the distributor/customer cannot, without proper authorization from the applicable United States Government Agency, export, re-export, or transfer any commodity, software, or technology purchased from Southworth, either directly or indirectly, to any entity, country, or national of any country in breach of such laws and regulations. Furthermore, Southworth expects that the distributor/customer shall indemnify and hold harmless Southworth from and against any claim, proceeding, action, fine, loss, cost and damages arising out of or relating to any noncompliance with export control regulations by distributor/customer, and distributor/customer are expected to compensate Southworth for all losses and expenses resulting thereof, unless such noncompliance was clearly not caused by fault of the distributor/customer.

Southworth Products, Corp.

PO Box 1380, Portland, ME 04104-1380

800.743.1000 | 207.878.0700 | F 207.797.4734

service@southworthproducts.com

www.SouthworthProducts.com

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(Find in Resource Library pull down menu)

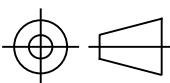
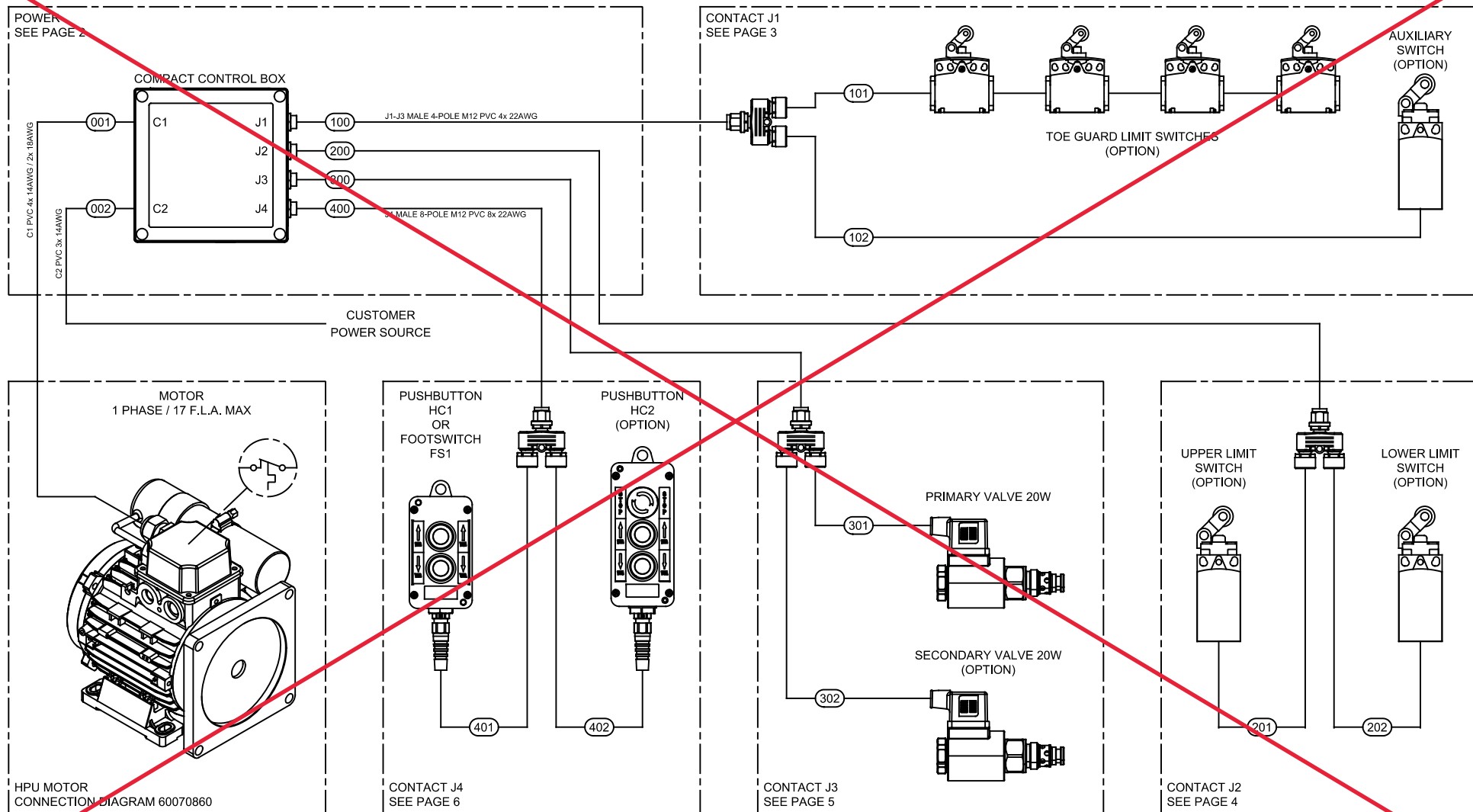
11 APPENDIX (ELECTRICAL WIRING DIAGRAMS)

11.1 Compact Control Box Wiring Diagram (8 pages) - 60070711

11.2 Standard Control Box Wiring Diagram (13 pages) - 60065342

11.3 Control Relay Box Wiring Diagram (4 pages) - 60078722

*** SEE WIRING DIAGRAM INDEX [60070711] SECTION IN OWNER MANUAL ***



3RD ANGLE PROJECTION

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DR HMS DATE 5-27-21

WT - SCALE -

EL WIRING DIAG 115 DC PWR SPLY

REF -

TITLE

A MODEL CCB 5

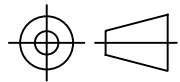
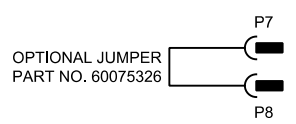
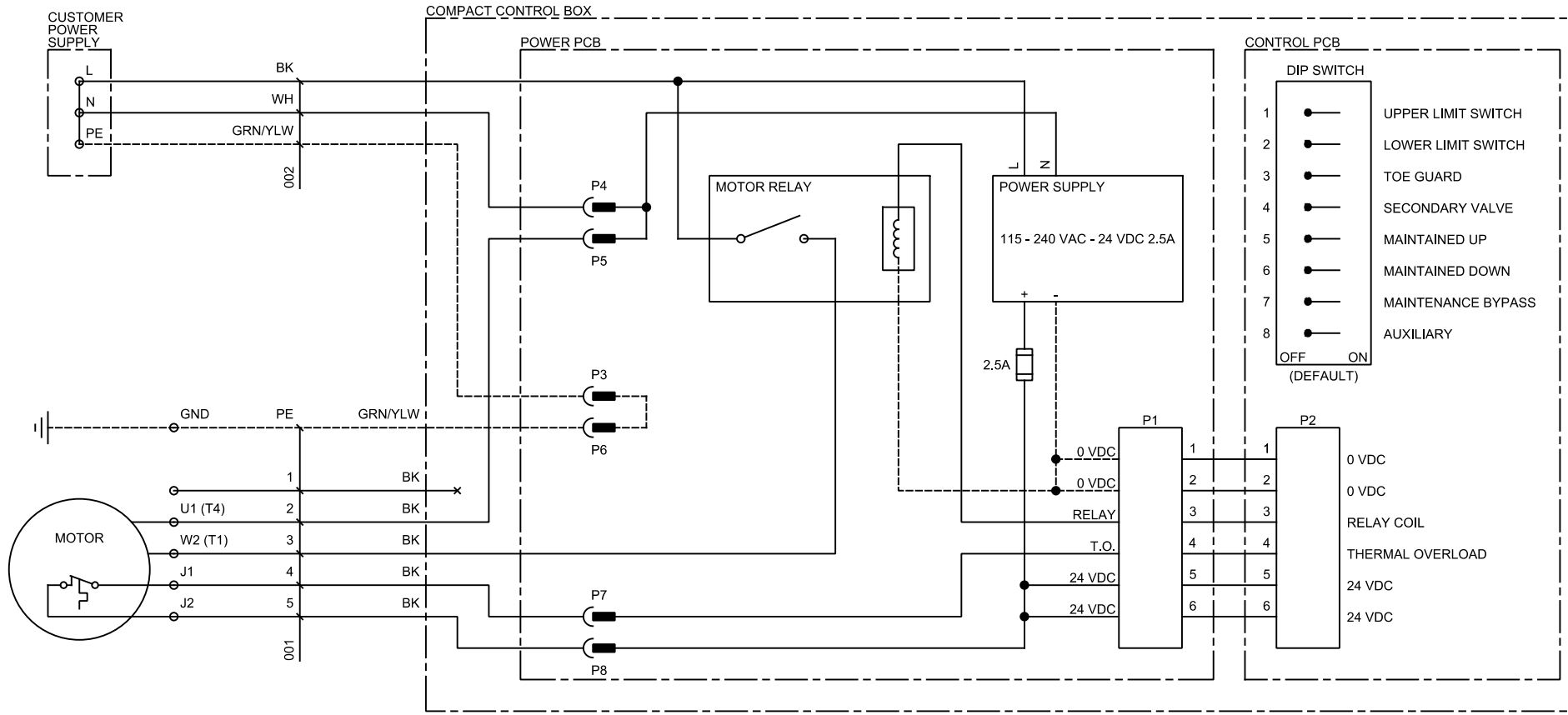
60070711

SIZE SHEET 1 OF 8 REV

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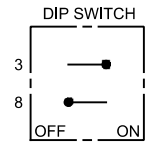
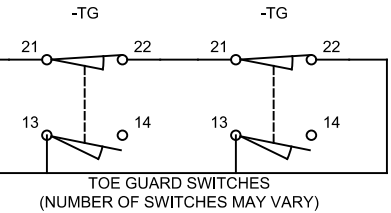
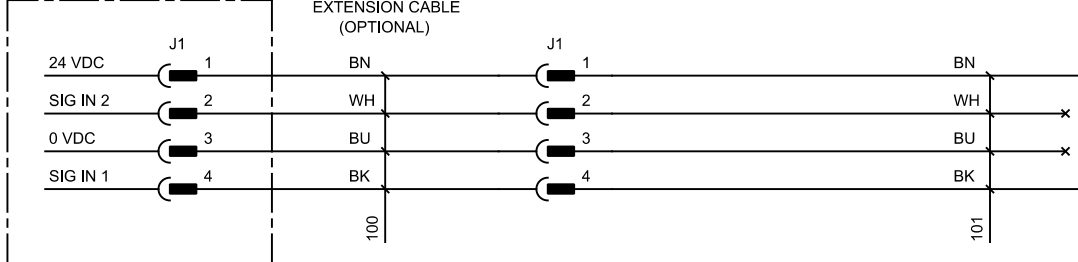
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A	MODEL	CCB	5
	SHEET 2 OF 8		

COMPACT CONTROL BOX

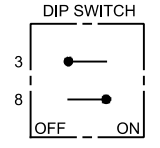
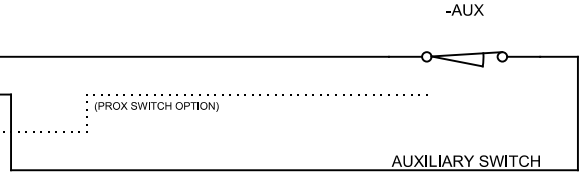
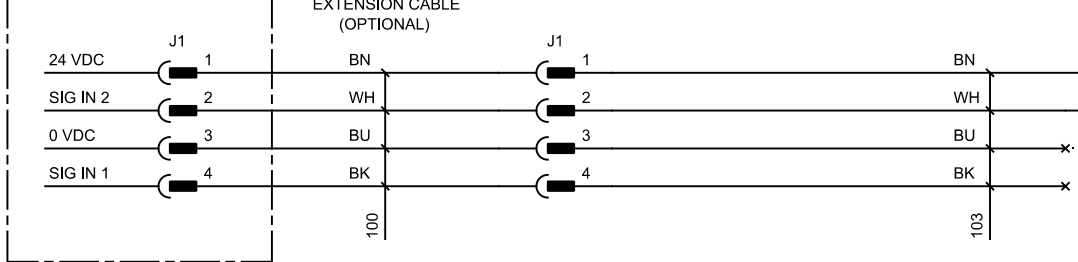
EXTENSION CABLE (OPTIONAL)



TOE GUARD (OPTION)

COMPACT CONTROL BOX

EXTENSION CABLE (OPTIONAL)

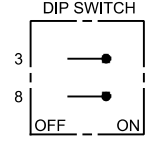
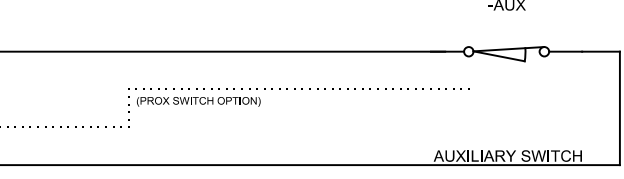
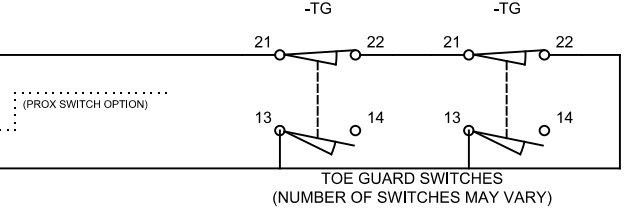
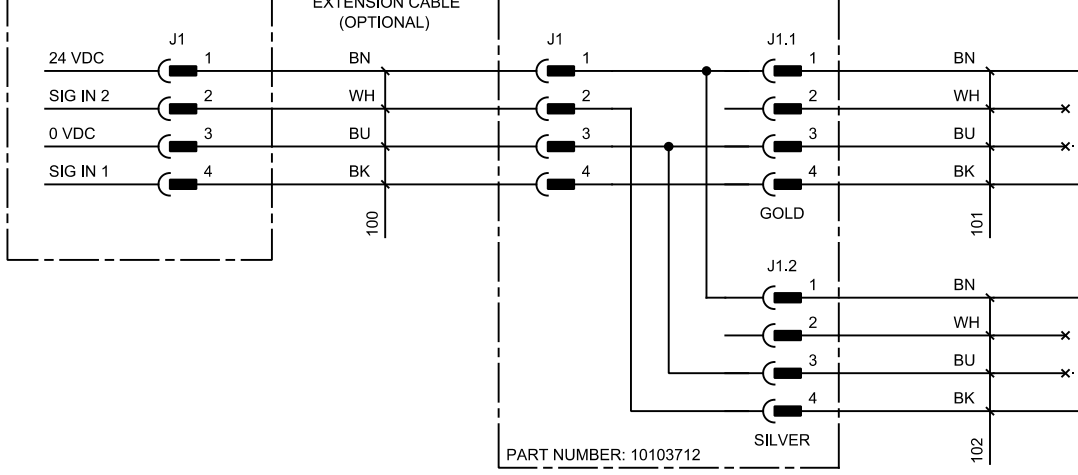


AUXILIARY SWITCH (OPTION)

COMPACT CONTROL BOX

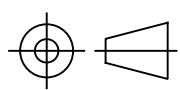
EXTENSION CABLE (OPTIONAL)

SPLITTER



TOE GUARD + AUXILIARY SWITCH (OPTION)

PART NUMBER: 10103712



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EL WIRING DIAG 115 DC PWR SPLY

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A	MODEL	CCB	5
	SHEET 3 OF 8		

60070711

SIZE	REV
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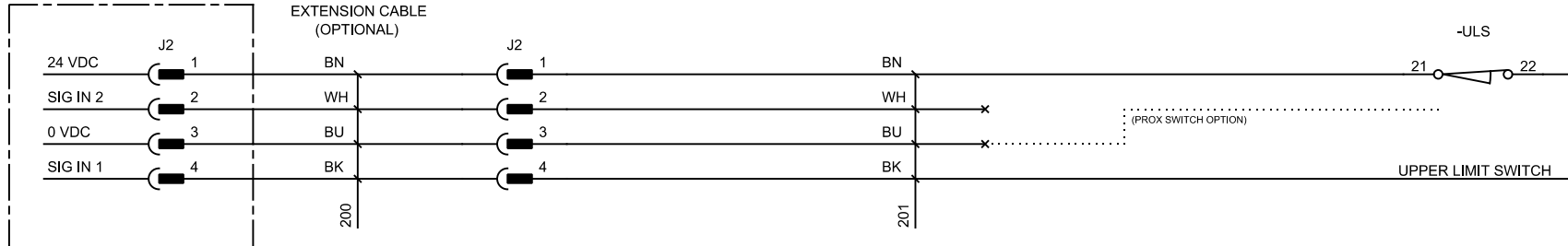
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COMPACT CONTROL BOX

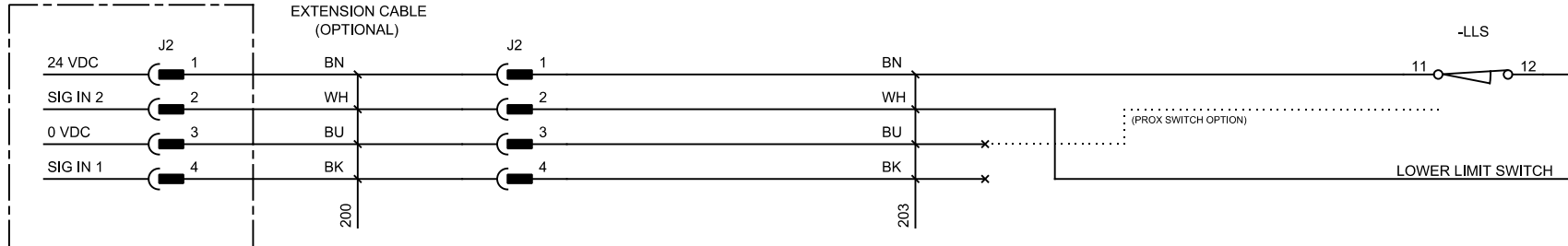
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UPPER LIMIT SWITCH (OPTION)

COMPACT CONTROL BOX

EXTENSION CABLE (OPTIONAL)

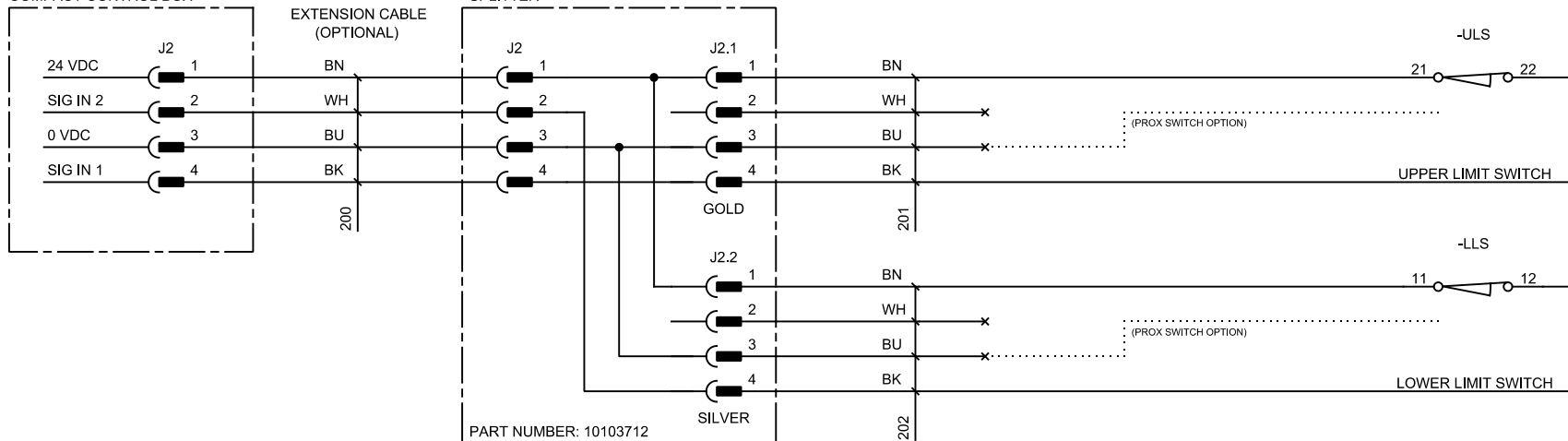


LOWER LIMIT SWITCH (OPTION)

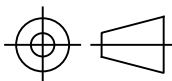
COMPACT CONTROL BOX

EXTENSION CABLE (OPTIONAL)

SPLITTER



UPPER LIMIT SWITCH + LOWER LIMIT SWITCH (OPTION)



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A MODEL CCB 5

SIZE SHEET 4 OF 8 REV

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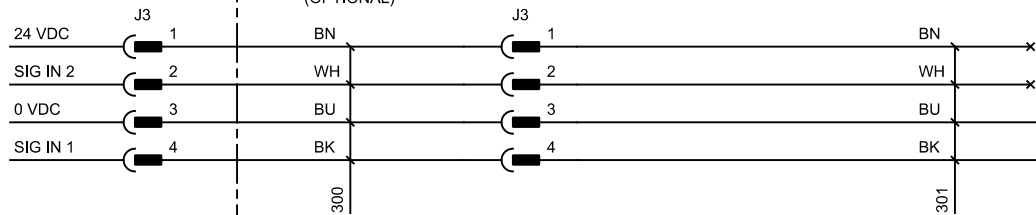
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STATUS:

COMPACT CONTROL BOX

EXTENSION CABLE (OPTIONAL)



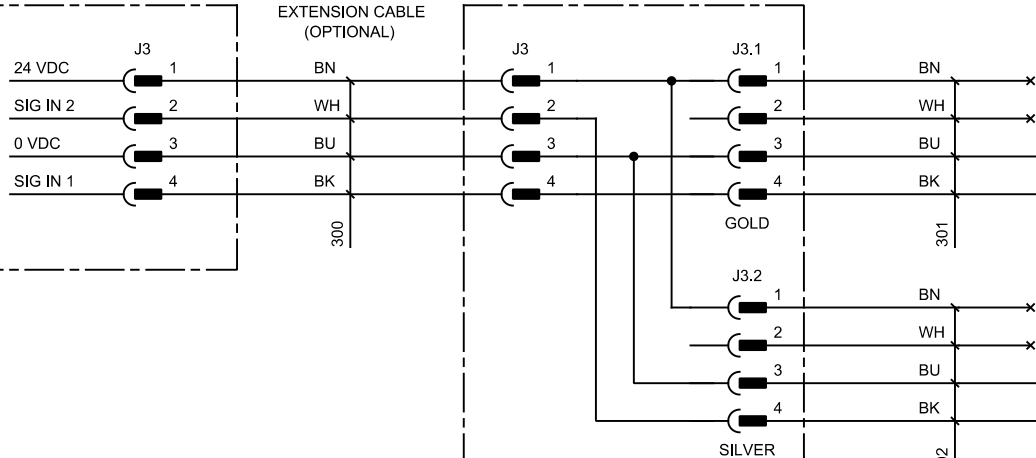
PRIMARY VALVE

DOWN VALVE (REQUIRED)

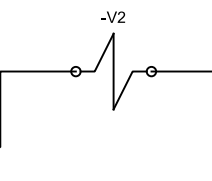
COMPACT CONTROL BOX

EXTENSION CABLE (OPTIONAL)

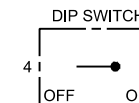
SPLITTER



PRIMARY VALVE

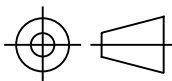


SECONDARY VALVE



PART NUMBER: 10103712

DOWN VALVE + SECONDARY VALVE (OPTION)



3RD ANGLE PROJECTION

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EL WIRING DIAG 115 DC PWR SPLY

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A MODEL CCB 5

SIZE SHEET 5 OF 8 REV

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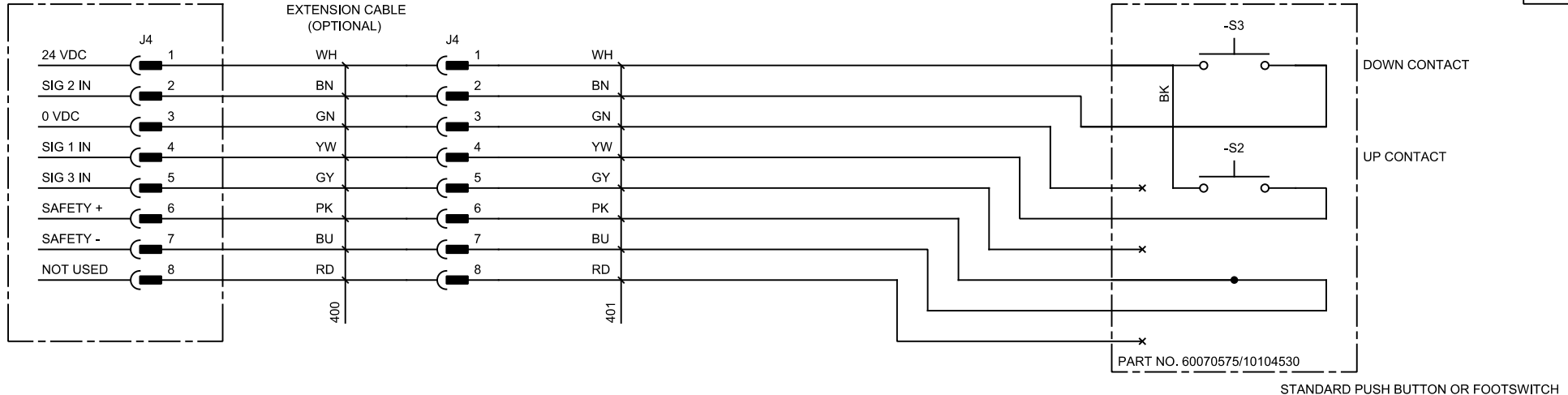
DWG NO.

60070711

COMPACT CONTROL BOX

EXTENSION CABLE (OPTIONAL)

-HC1 OR -FS1

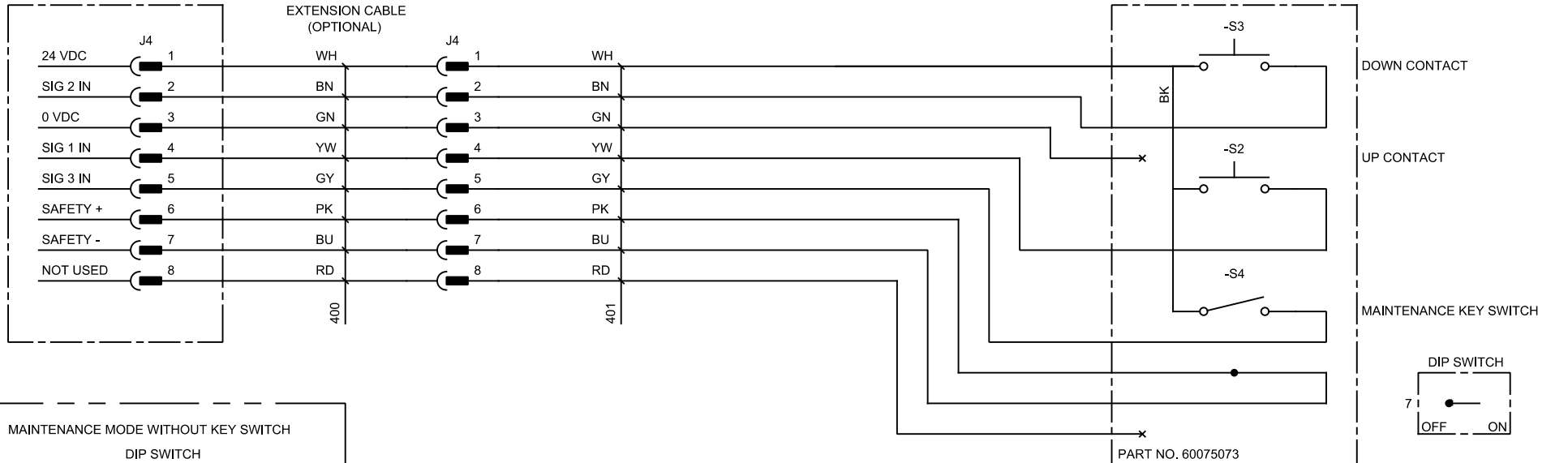


STANDARD PUSH BUTTON OR FOOTSWITCH

COMPACT CONTROL BOX

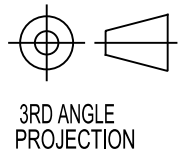
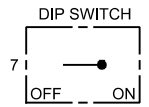
EXTENSION CABLE (OPTIONAL)

-HC1



MAINTENANCE PUSH BUTTON (OPTION)

MAINTENANCE MODE WITHOUT KEY SWITCH



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EL WIRING DIAG 115 DC PWR SPLY

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A	MODEL	CCB	5
	SHEET 6 OF 8		
SIZE			REV

PROJECT: G.C.E.

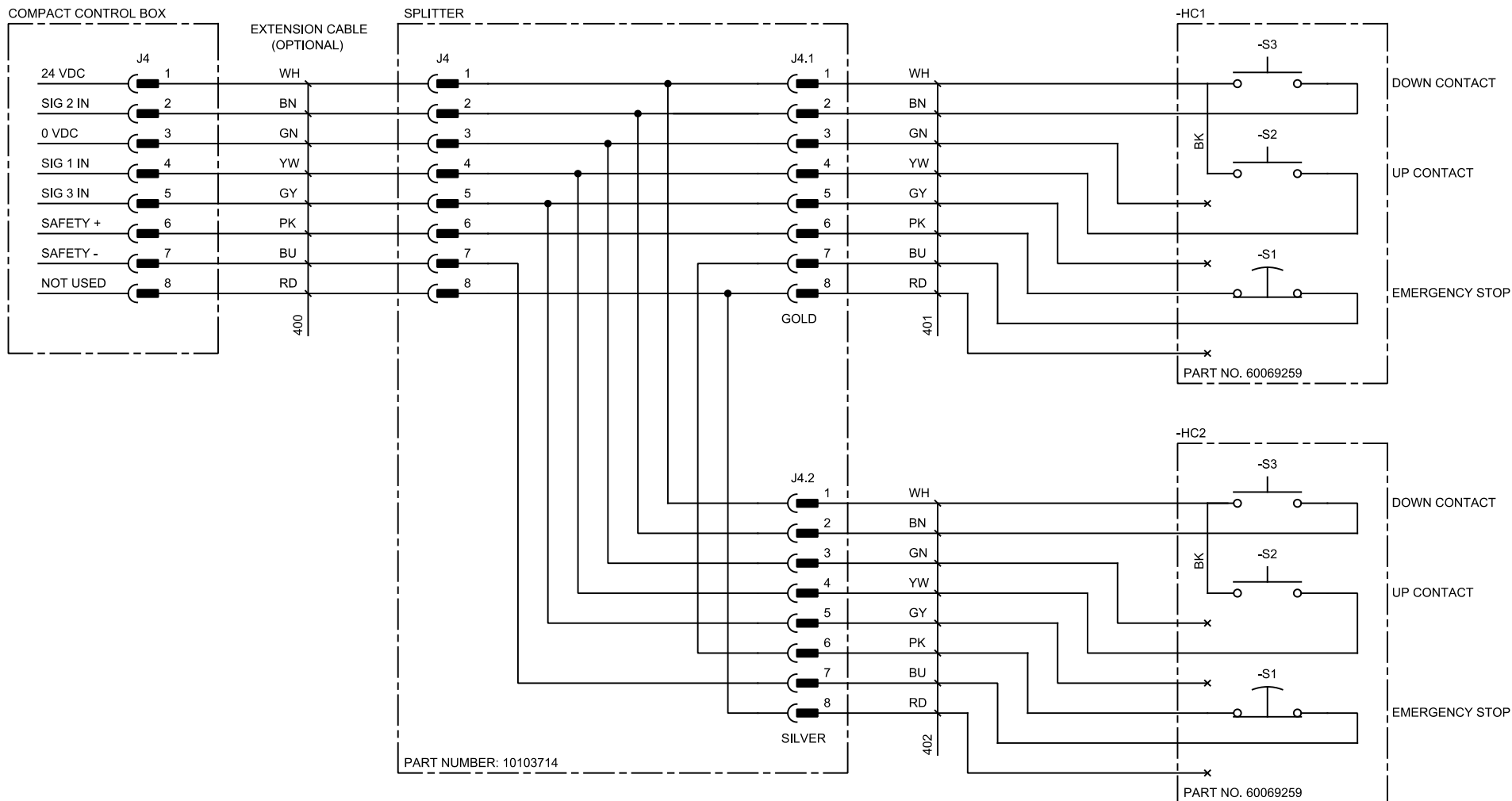
USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

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CAGE CODE

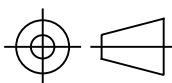
TITLE

DWG NO.

60070711



DUAL PUSH BUTTON WITH E-STOP (OPTION)



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P.O. Box 1380 Portland Maine 04104-1380

EL WIRING DIAG 115 DC PWR SPLY

60070711

DR HMS DATE 5-27-21

WT - SCALE -

REF -

A MODEL CCB 5

SIZE SHEET 7 OF 8 REV

PROJECT: G.C.E.

STATUS: USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8 CAGE CODE

TITLE

DWG NO.

STATUS INDICATION (GREEN LIGHT)

1	STATUS "OK"	INDICATES, WITH A STEADY SIGNAL, WHEN THE SYSTEM IS OK AND NO FAULTS ARE DETECTED
---	-------------	---

STATUS INDICATION (AMBER LIGHT)

1	EMERGENCY STOP	INDICATES, WITH A STEADY SIGNAL, WHEN THE EMERGENCY STOP IS ACTIVATED
---	----------------	---

STATUS INDICATION (RED LIGHT)

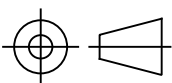
1	TOE GUARD	INDICATES, WITH A STEADY SIGNAL, WHEN THE TOE GUARD IS ACTIVATED
---	-----------	--

STATUS INDICATION (AMBER FLASHES)

1	UPPER LIMIT SWITCH	INDICATES (ONE AMBER FLASH) WHEN THE UPPER LIMIT SWITCH AND THE UP SIGNAL ARE ACTIVATED SIMULTANEOUSLY
2	LOWER LIMIT SWITCH	INDICATES (TWO AMBER FLASHES) WHEN THE LOWER LIMIT SWITCH AND THE DOWN SIGNAL ARE ACTIVATED SIMULTANEOUSLY
3	MAINTENANCE BYPASS	INDICATES (ONE LONG AMBER FLASH) WHEN MAINTENANCE MODE IS ACTIVATED

ALARMS (RED FLASHES)

1	MAINTAINED UP FAULT	INDICATES (ONE RED FLASH) A CONFIGURATION FAULT WITH MAINTAINED UP OPTION THE MAINTAINED UP DIPSWITCH SETTING IS ACTIVE BUT UPPER LIMIT SWITCH DIPSWITCH IS OFF
2	MAINTAINED DOWN FAULT	INDICATES (TWO RED FLASHES) A CONFIGURATION FAULT WITH MAINTAINED DOWN OPTION THE MAINTAINED DOWN DIPSWITCH SETTING IS ACTIVE BUT LOWER LIMIT SWITCH DIPSWITCH IS OFF
3	MOTOR OVERHEATED	INDICATES (THREE RED FLASHES) WHEN THE TEMPERATURE SWITCH IS ACTIVATED. INDICATES UNTIL IT WILL BE RESET BY THE UP SIGNAL AND THE TEMPERATURE IS DECREASED
4	TOE GUARD FAULT	INDICATES (FOUR RED FLASHES) A CONFIGURATION FAULT WITH THE TOE GUARD OPTION THE TOE GUARD IS CONNECTED BUT THE DIPSWITCH SETTING IS OFF



3RD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ACCORDING TO ISO 2768-cK

DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

PROJECT: G.C.E.

USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8 CAGE CODE

TITLE

DWG NO.

SIGI

P.O. Box 1380 Portland Maine 04104-1380

EL WIRING DIAG 115 DC PWR SPLY

60070711

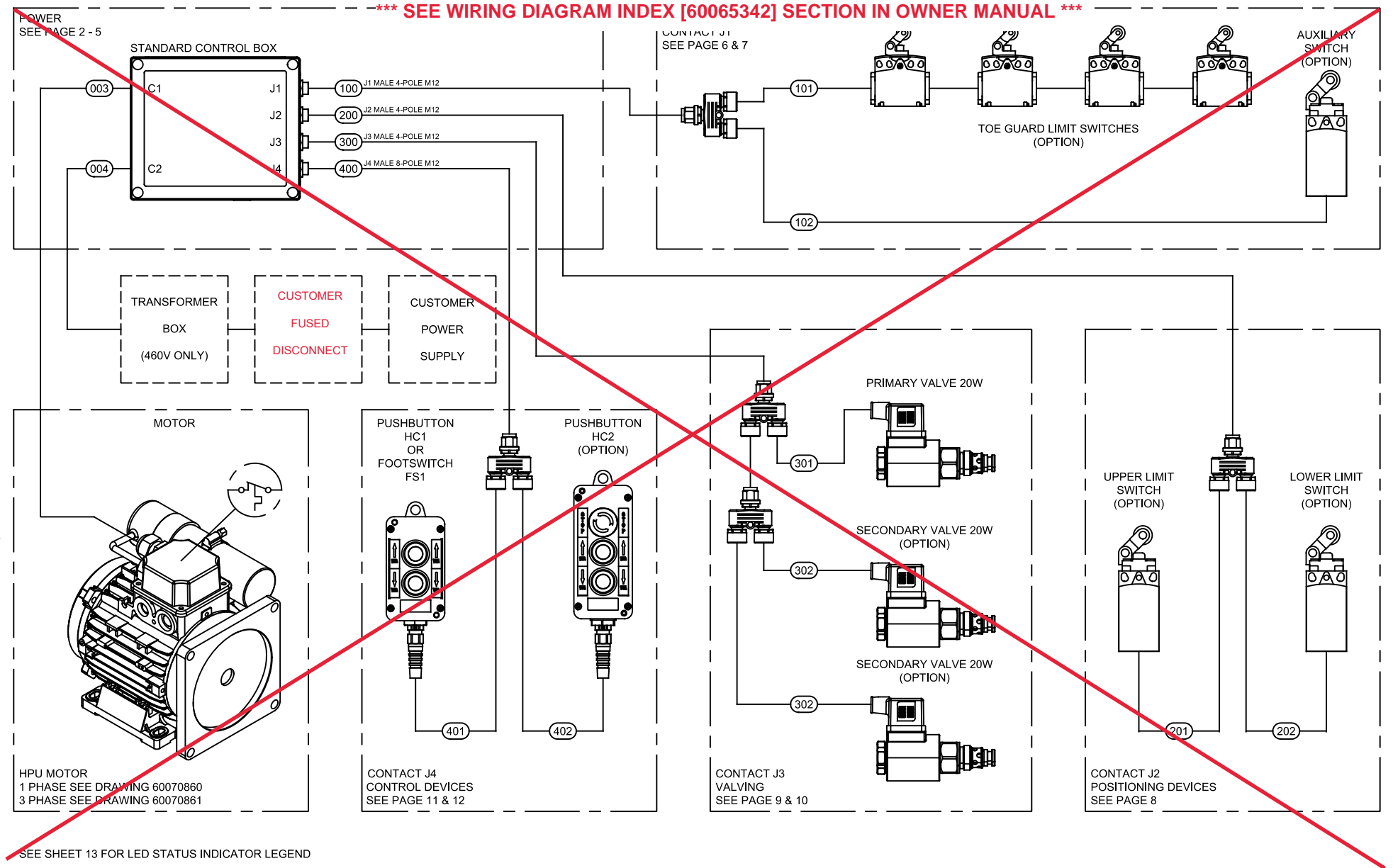
DR HMS DATE 5-27-21

WT - SCALE -

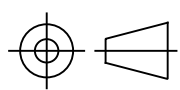
REF -

A MODEL CCB 5 SHEET 8 OF 8 REV

*** SEE WIRING DIAGRAM INDEX [60065342] SECTION IN OWNER MANUAL ***



SEE SHEET 13 FOR LED STATUS INDICATOR LEGEND



UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ACCORDING TO ISO 2768-cK

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 P.O. Box 1380 Portland Maine 04104-1380

DR HMS DATE 5/23/23

WT - SCALE -

TITLE
EL WIRING DIAG DC PWR SPLY

REF -

A MODEL SCB A

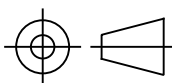
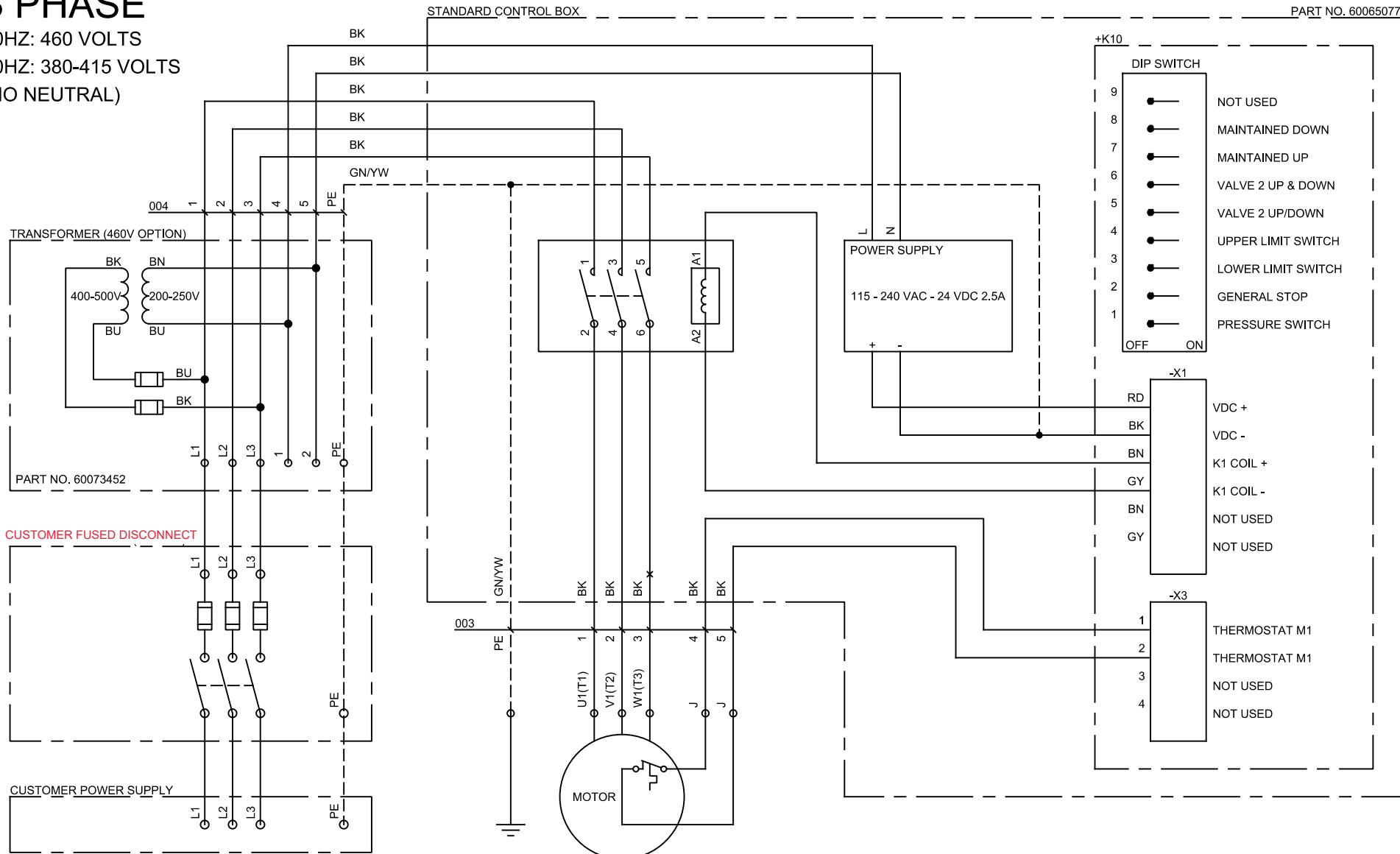
DWG NO. **60065342**

SIZE SHEET 1 OF 13 REV



3 PHASE

60HZ: 460 VOLTS
50HZ: 380-415 VOLTS
(NO NEUTRAL)



3RD ANGLE PROJECTION

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EL WIRING DIAG DC PWR SPLY

DR HMS DATE 5/23/23

WT - SCALE -

REF -

A MODEL SCB A

SIZE SHEET 2 OF 13 REV

PROJECT: G.C.E.

STATUS: USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8 CAGE CODE

TITLE

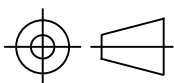
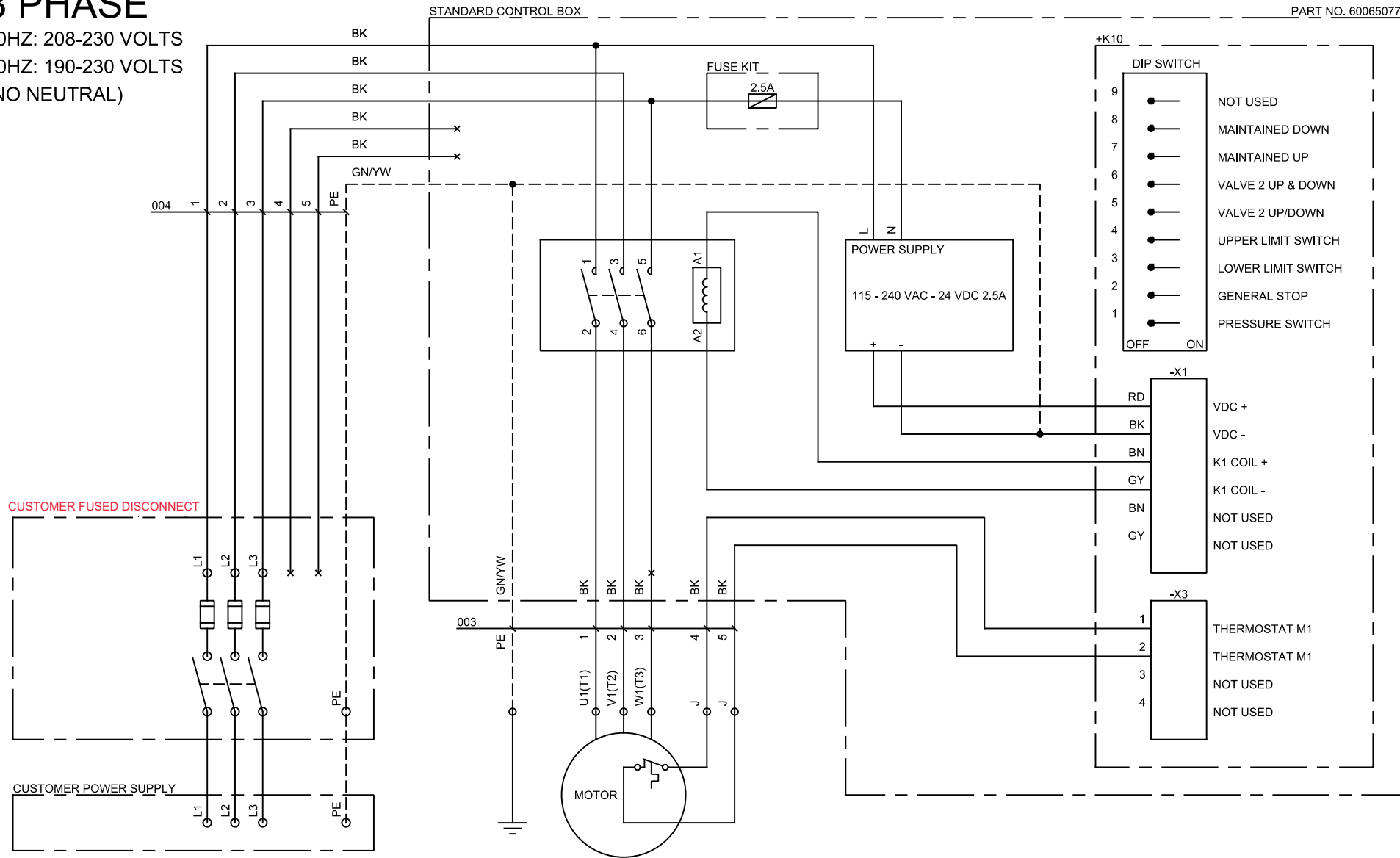
DWG NO.

60065342

3 PHASE

60HZ: 208-230 VOLTS
50HZ: 190-230 VOLTS
(NO NEUTRAL)

PART NO. 60065077



3RD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ACCORDING TO ISO 2768-cK

DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

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EL WIRING DIAG DC PWR SPLY

60065342

DR HMS DATE 5/23/23

WT - SCALE -

REF -

A	MODEL	SCB	A
	SHEET 3 OF 13		

PROJECT: G.C.E.
STATUS: USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8
CAGE CODE

TITLE
DWG NO.

1 PHASE

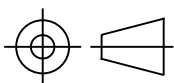
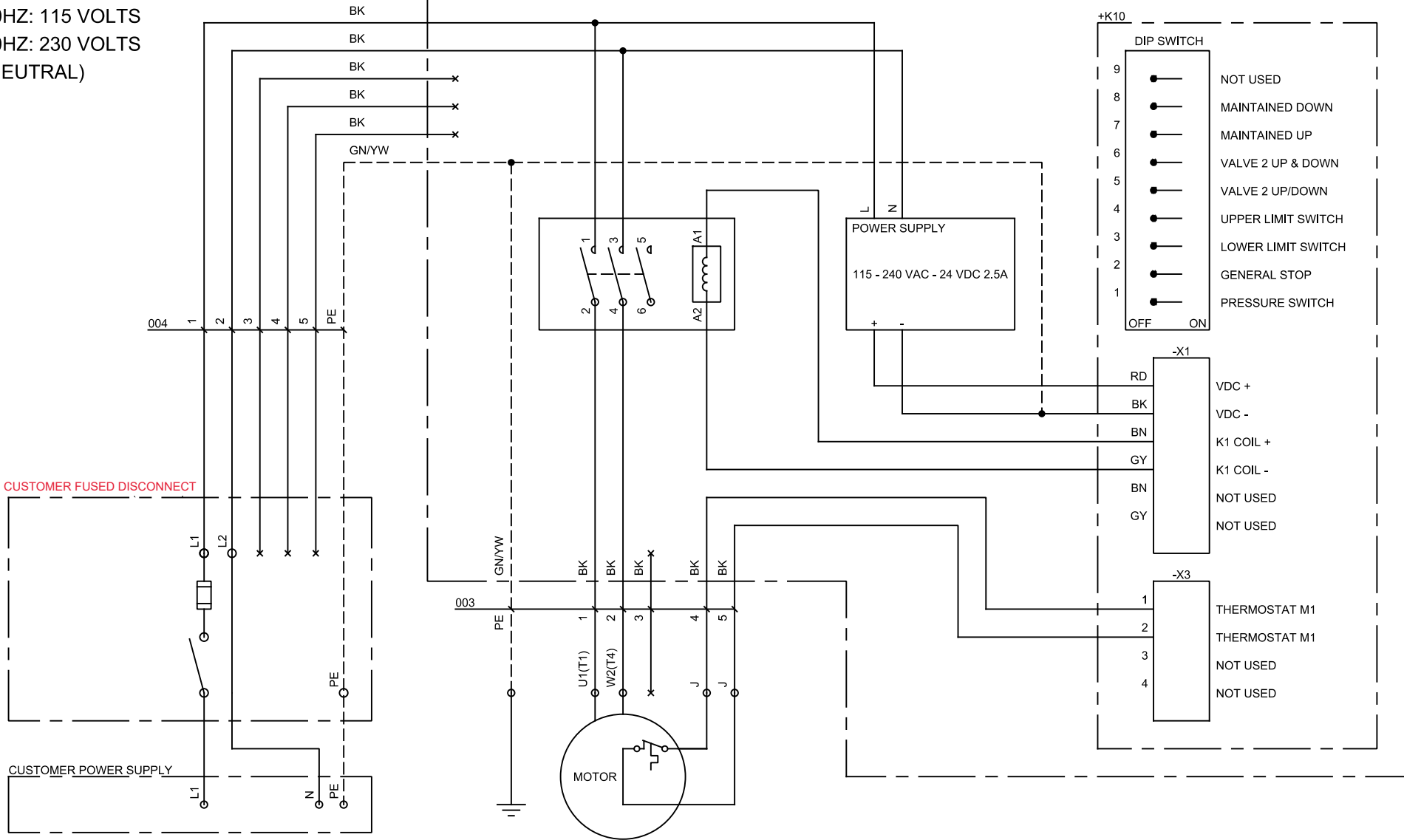
60HZ: 115 VOLTS
50HZ: 230 VOLTS
(NEUTRAL)

PART NO. 60065077

CUSTOMER FUSED DISCONNECT

CUSTOMER POWER SUPPLY

STANDARD CONTROL BOX



3RD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ACCORDING TO ISO 2768-cK

DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

SIGI

P.O. Box 1380 Portland Maine 04104-1380

EL WIRING DIAG DC PWR SPLY

60065342

DR HMS DATE 5/23/23

WT - SCALE -

REF -

A MODEL SCB A

SIZE SHEET 4 OF 13 REV

STATUS: USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

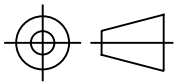
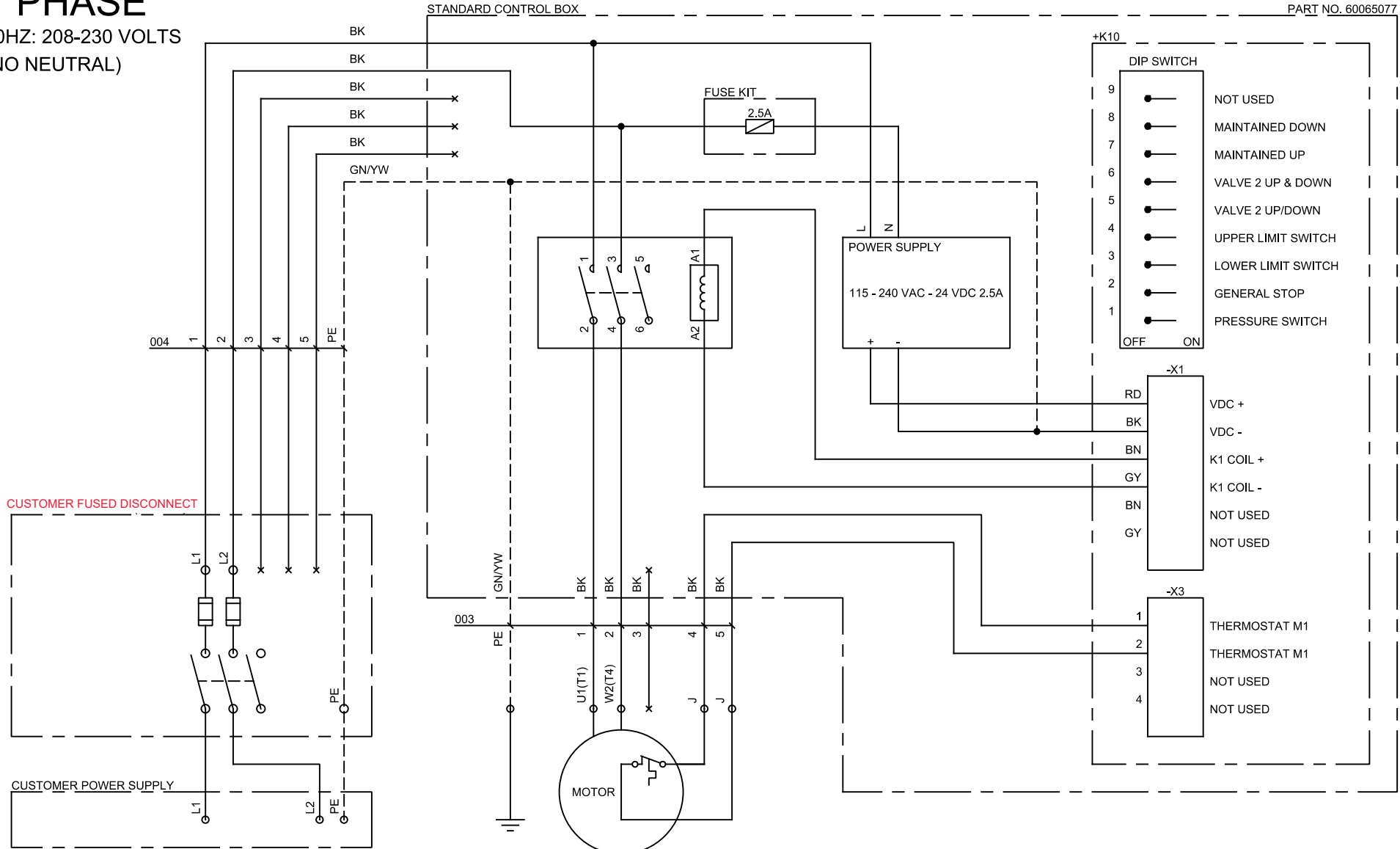
063Z8 CAGE CODE

TITLE DWG NO.

1 PHASE

60HZ: 208-230 VOLTS
(NO NEUTRAL)

PART NO. 60065077



3RD ANGLE
PROJECTION

UNLESS OTHERWISE
SPECIFIED
TOLERANCES ARE
ACCORDING TO
ISO 2768-cK

DIMENSIONS ARE IN
MILLIMETERS UNLESS
OTHERWISE SPECIFIED.

SIGI

P.O. Box 1380 Portland Maine 04104-1380

EL WIRING DIAG DC PWR SPLY

DR HMS DATE 5/23/23

WT - SCALE -

REF -

A MODEL SCB A

SIZE SHEET 5 OF 13 REV

PROJECT: G.C.E.

STATUS: USE OF PROPRIETARY INFORMATION
LIMITED TO WRITTEN AGREEMENT

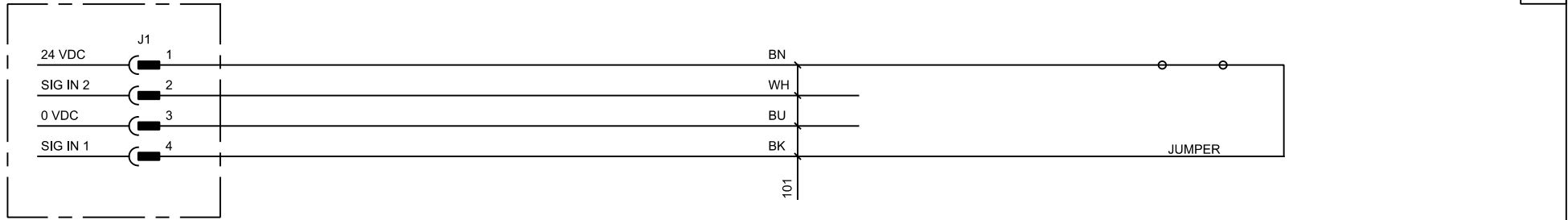
063Z8
CAGE CODE

TITLE

DWG NO.

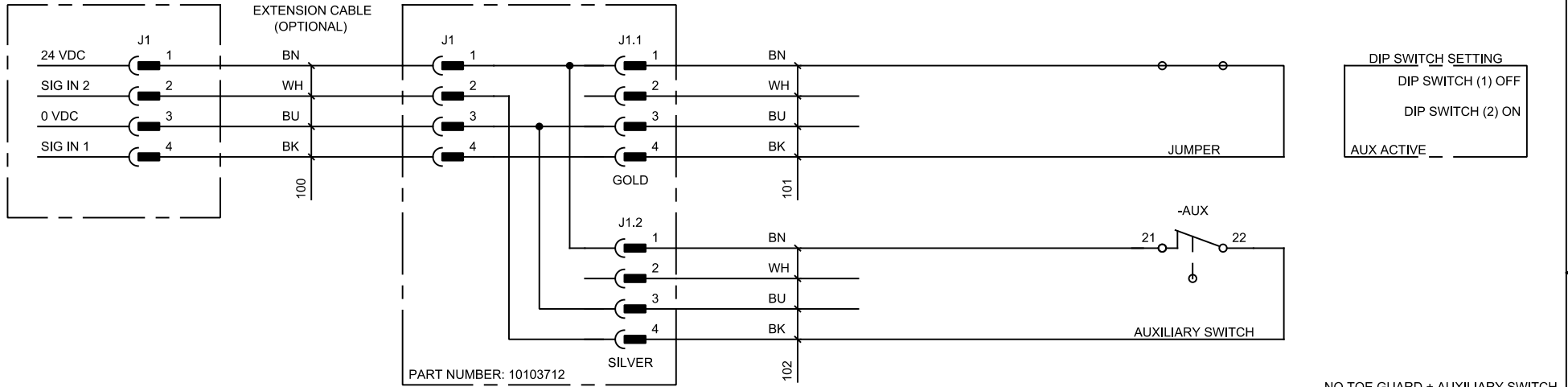
60065342

STANDARD CONTROL BOX



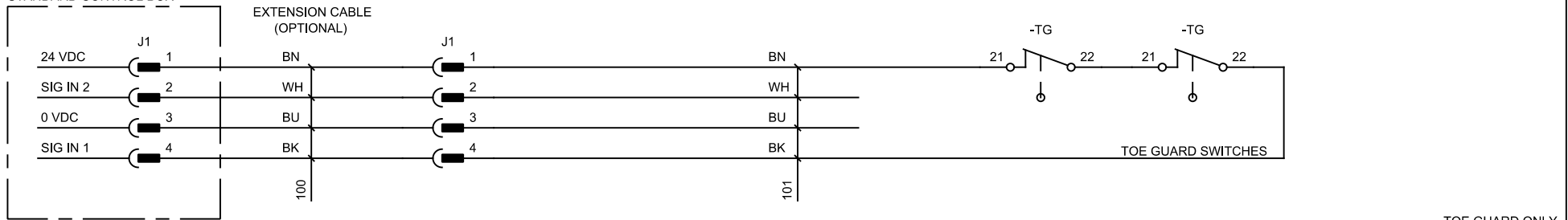
NO TOE GUARD / NO AUXILIARY SWITCH / NO PRESSURE SWITCH

STANDARD CONTROL BOX

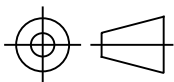


NO TOE GUARD + AUXILIARY SWITCH

STANDARD CONTROL BOX



TOE GUARD ONLY



3RD ANGLE PROJECTION

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EL WIRING DIAG DC PWR SPLY

DR HMS DATE 5/23/23

WT - SCALE -

REF -

A MODEL SCB A

SIZE SHEET 6 OF 13 REV

PROJECT: G.C.E.

TITLE

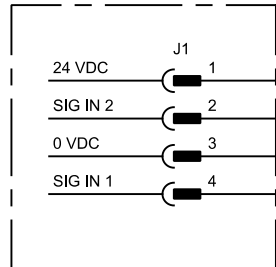
60065342

STATUS: USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

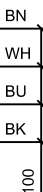
063Z8 CAGE CODE

DWG NO.

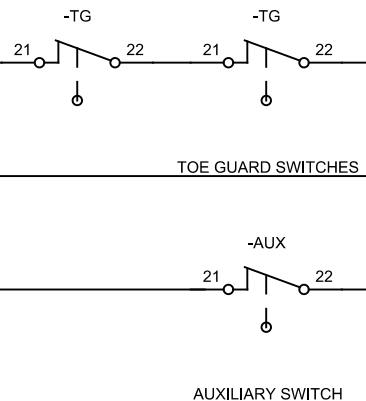
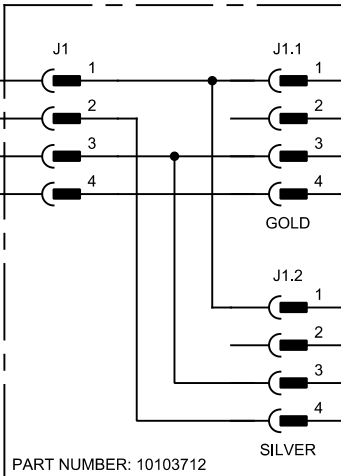
STANDARD CONTROL BOX



EXTENSION CABLE (OPTIONAL)



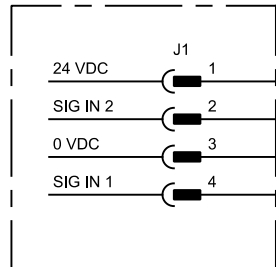
SPLITTER



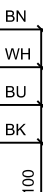
DIP SWITCH SETTING
DIP SWITCH (1) OFF
DIP SWITCH (2) ON
TG + AUX ACTIVE

TOE GUARD + AUXILIARY SWITCH

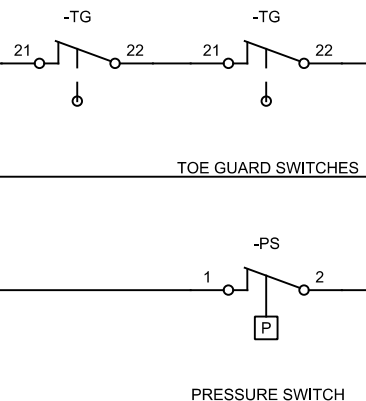
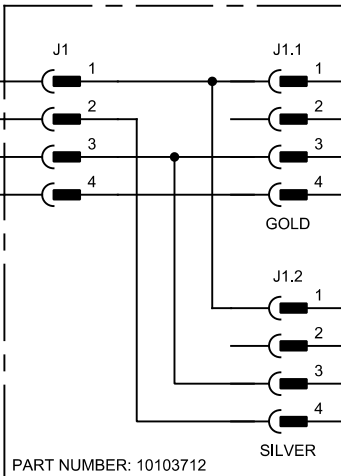
STANDARD CONTROL BOX



EXTENSION CABLE (OPTIONAL)

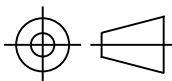


SPLITTER



DIP SWITCH SETTING
DIP SWITCH (1) ON
DIP SWITCH (2) OFF
TG + PS ACTIVE

TOE GUARD + PRESSURE SWITCH



3RD ANGLE PROJECTION

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DR HMS DATE 5/23/23

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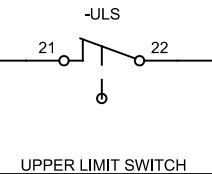
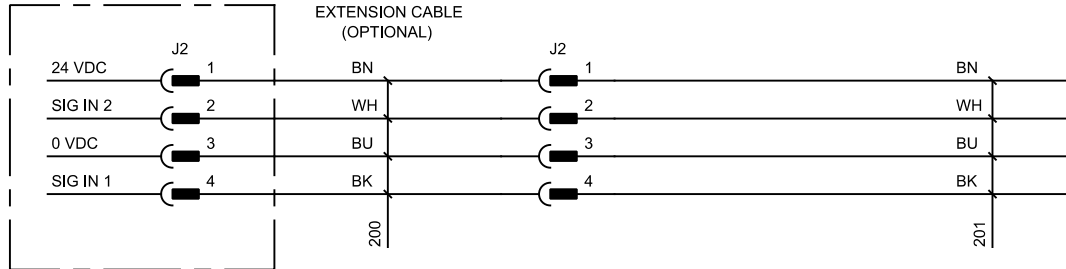
A MODEL SCB A

SIZE SHEET 7 OF 13 REV

DWG NO. 60065342

STANDARD CONTROL BOX

EXTENSION CABLE (OPTIONAL)

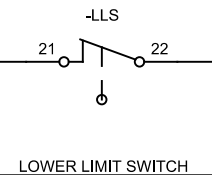
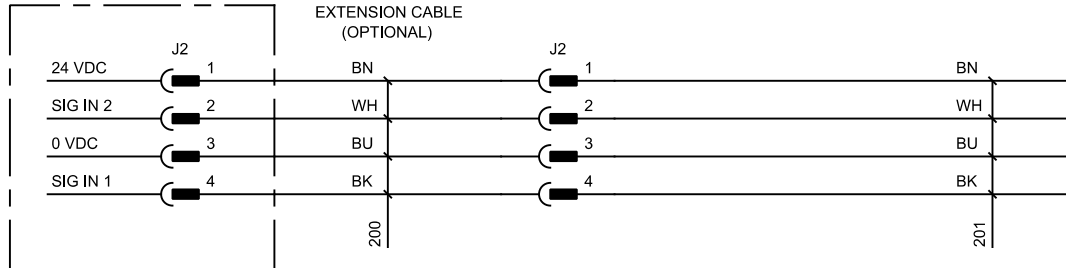


DIP SWITCH SETTING
 DIP SWITCH (4) ON
 ULS ACTIVE

UPPER LIMIT SWITCH

STANDARD CONTROL BOX

EXTENSION CABLE (OPTIONAL)



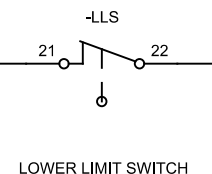
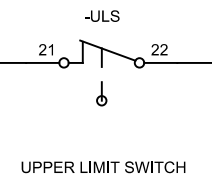
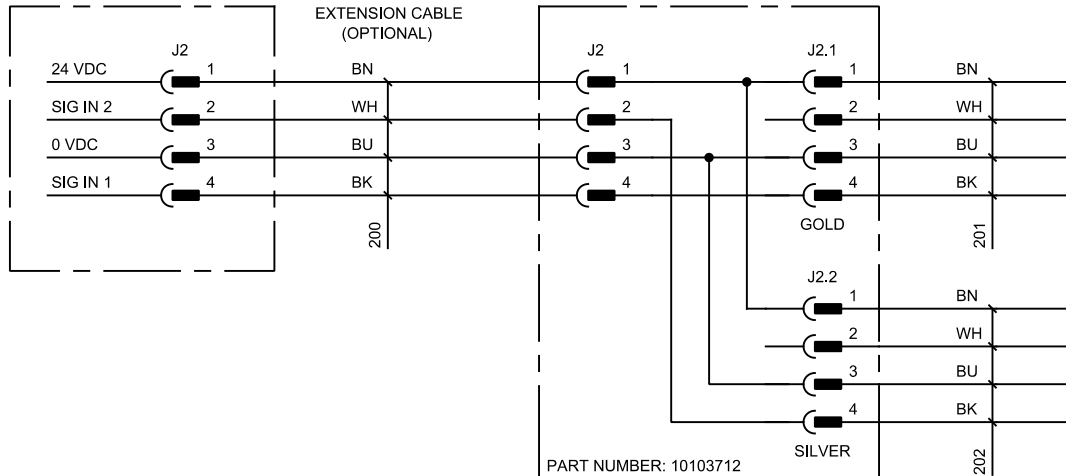
DIP SWITCH SETTING
 DIP SWITCH (3) ON
 LLS ACTIVE

LOWER LIMIT SWITCH

STANDARD CONTROL BOX

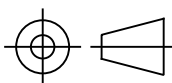
EXTENSION CABLE (OPTIONAL)

SPLITTER



DIP SWITCH SETTING
 DIP SWITCH (3) ON
 DIP SWITCH (4) ON
 ULS + LLS ACTIVE

UPPER LIMIT SWITCH + LOWER LIMIT SWITCH



3RD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ACCORDING TO ISO 2768-cK

DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

SIGI

P.O. Box 1380 Portland Maine 04104-1380

EL WIRING DIAG DC PWR SPLY

DR	HMS	DATE	5/23/23
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WT	-	SCALE	-
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REF	-
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A	MODEL	SCB	A
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SIZE	SHEET 8 OF 13	REV
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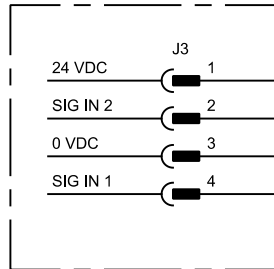
PROJECT: G.C.E.
 STATUS: USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8
 CAGE CODE

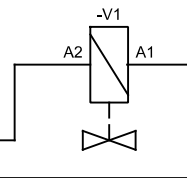
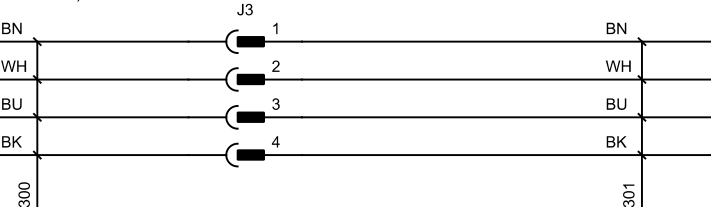
TITLE
 DWG NO.

60065342

STANDARD CONTROL BOX



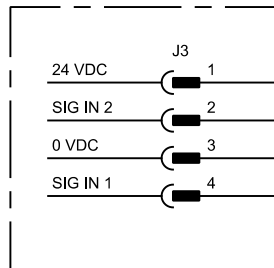
EXTENSION CABLE (OPTIONAL)



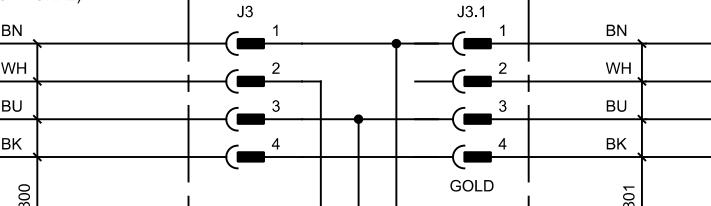
PRIMARY VALVE

DOWN VALVE

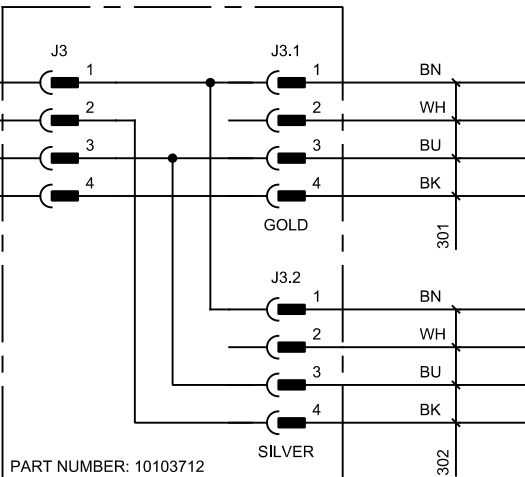
STANDARD CONTROL BOX



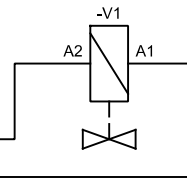
EXTENSION CABLE (OPTIONAL)



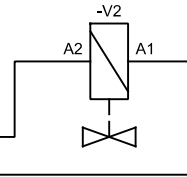
SPLITTER



PART NUMBER: 10103712



PRIMARY VALVE



SECONDARY VALVE

DOWN VALVE + SECONDARY VALVE

DIP SWITCH SETTING

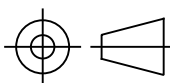
DIP SWITCH (5) OFF
 DIP SWITCH (6) OFF
 V2 ACTIVE DOWN

DIP SWITCH SETTING

DIP SWITCH (5) ON
 DIP SWITCH (6) OFF
 V2 ACTIVE UP

DIP SWITCH SETTING

DIP SWITCH (5) OFF
 DIP SWITCH (6) ON
 V2 ACTIVE UP & DOWN



3RD ANGLE PROJECTION

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EL WIRING DIAG DC PWR SPLY

DR	HMS	DATE	5/23/23
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WT	-	SCALE	-
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REF	-
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A	MODEL	SCB	A
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SIZE	SHEET 9 OF 13	REV	
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PROJECT: G.C.E.

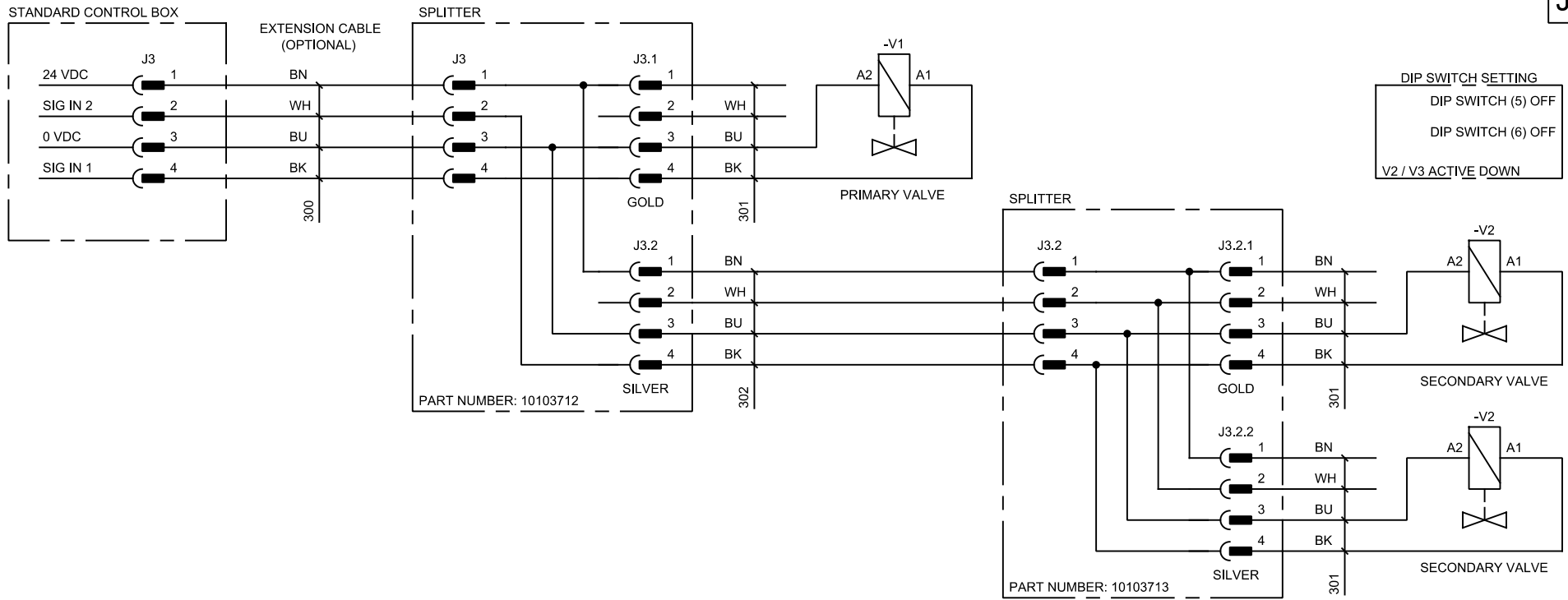
STATUS: USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8
CAGE CODE

TITLE

DWG NO.

60065342



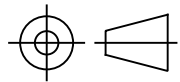
B

B

A

A

DOWN VALVE + 2 SECONDARY VALVES



3RD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ACCORDING TO ISO 2768-cK

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P.O. Box 1380 Portland Maine 04104-1380

DR	HMS	DATE	5/23/23
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WT	-	SCALE	-
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TITLE EL WIRING DIAG DC PWR SPLY

REF	-
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A	MODEL	SCB	A
	SHEET 10 OF 13		

DWG NO. 60065342

SIZE	REV
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PROJECT: G.C.E.

STATUS: USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

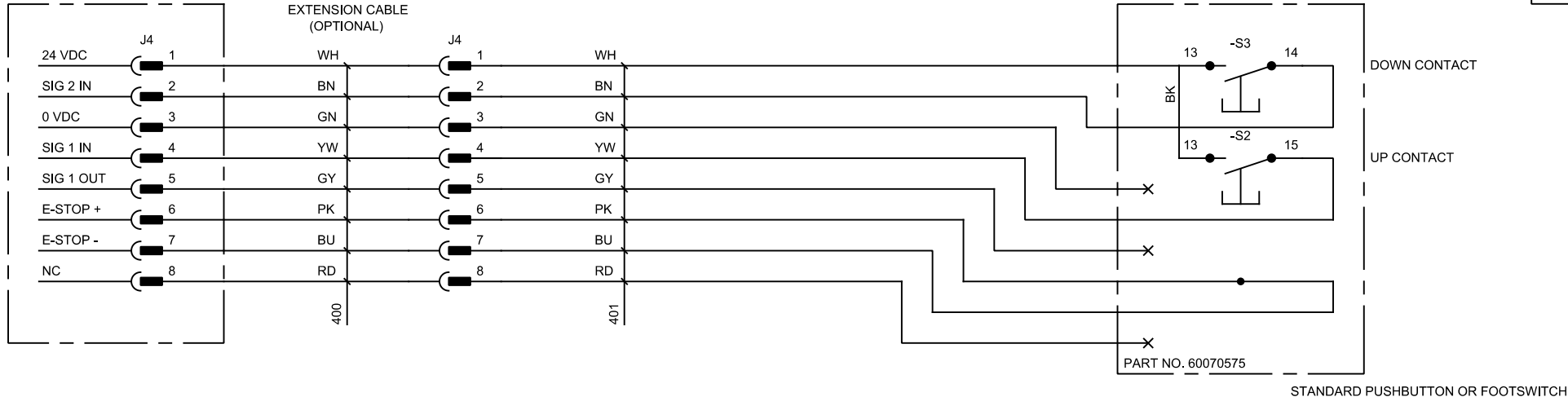
063Z8
CAGE CODE

DWG NO.

STANDARD CONTROL BOX

EXTENSION CABLE (OPTIONAL)

-HC1 OR -FS1

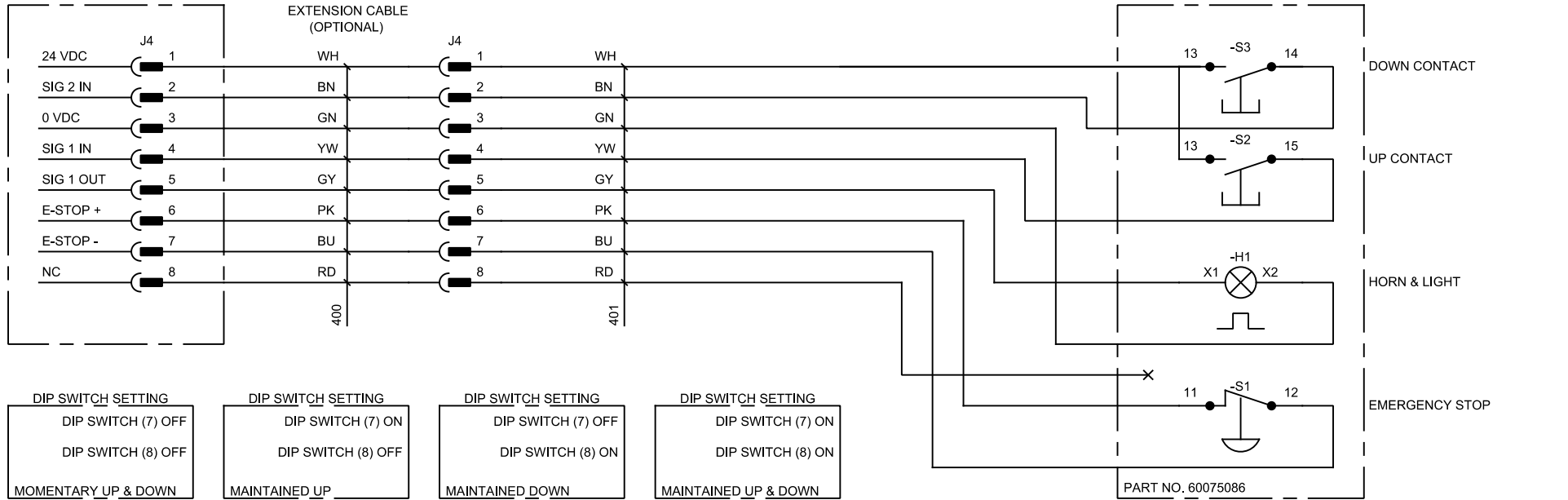


STANDARD PUSHBUTTON OR FOOTSWITCH

STANDARD CONTROL BOX

EXTENSION CABLE (OPTIONAL)

-HC1



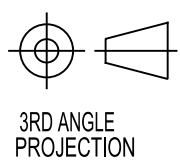
E-STOP WITH HORN & LIGHT PUSHBUTTON

DIP SWITCH SETTING
 DIP SWITCH (7) OFF
 DIP SWITCH (8) OFF
 MOMENTARY UP & DOWN

DIP SWITCH SETTING
 DIP SWITCH (7) ON
 DIP SWITCH (8) OFF
 MAINTAINED UP

DIP SWITCH SETTING
 DIP SWITCH (7) OFF
 DIP SWITCH (8) ON
 MAINTAINED DOWN

DIP SWITCH SETTING
 DIP SWITCH (7) ON
 DIP SWITCH (8) ON
 MAINTAINED UP & DOWN



UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ACCORDING TO ISO 2768-cK

 DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

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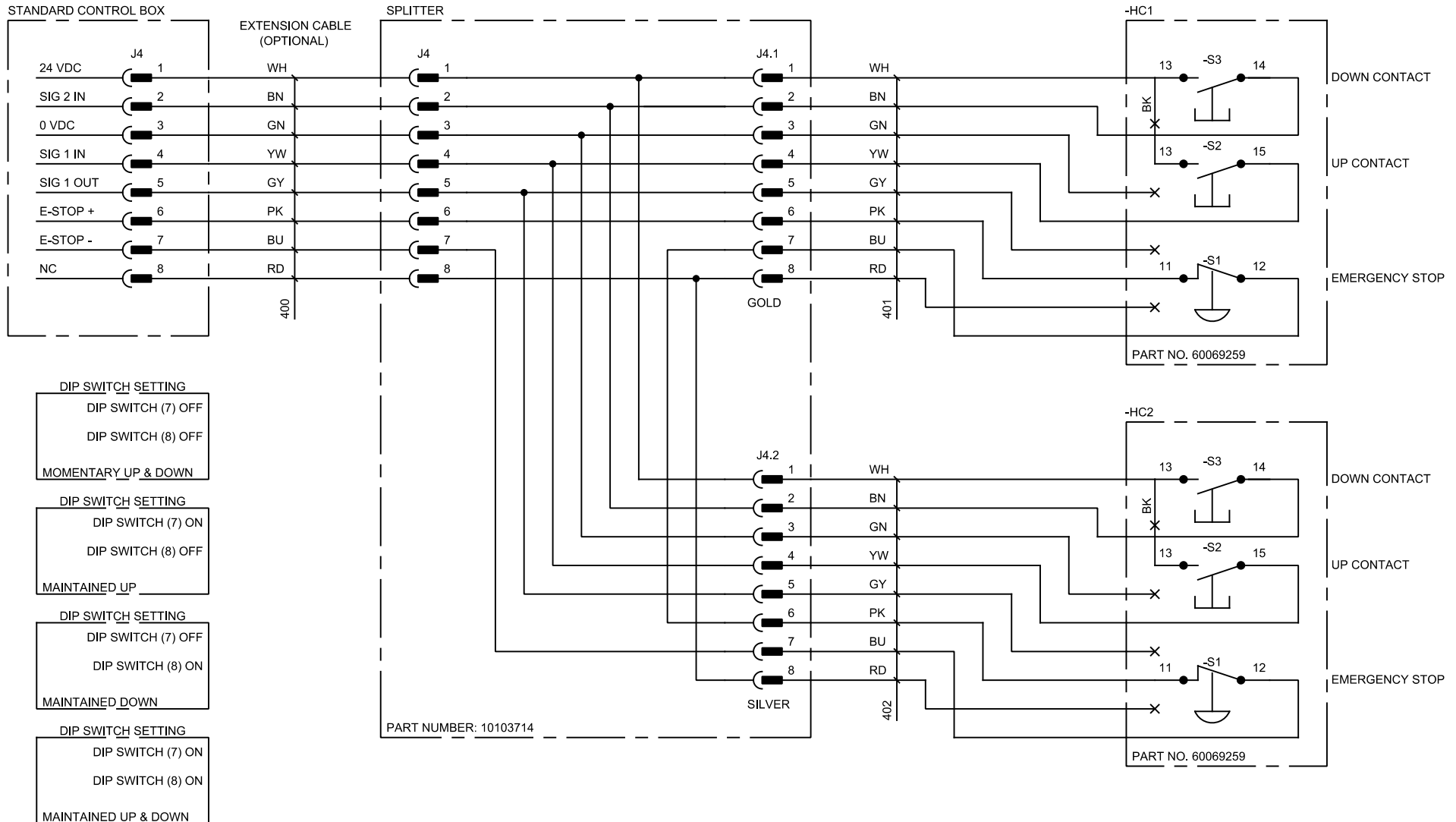
DR	HMS	DATE	5/23/23
WT	-	SCALE	-
REF	-		
A	MODEL	SCB	A
	SHEET 11 OF 13		
SIZE			REV

PROJECT: G.C.E.
 STATUS: USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8
 CAGE CODE

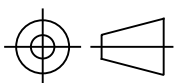
DWG NO.

60065342



- DIP SWITCH SETTING**
 DIP SWITCH (7) OFF
 DIP SWITCH (8) OFF
 MOMENTARY UP & DOWN
- DIP SWITCH SETTING**
 DIP SWITCH (7) ON
 DIP SWITCH (8) OFF
 MAINTAINED UP
- DIP SWITCH SETTING**
 DIP SWITCH (7) OFF
 DIP SWITCH (8) ON
 MAINTAINED DOWN
- DIP SWITCH SETTING**
 DIP SWITCH (7) ON
 DIP SWITCH (8) ON
 MAINTAINED UP & DOWN

DUAL PUSHBUTTON WITH E-STOP



3RD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE ACCORDING TO ISO 2768-cK

DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

SIGI

P.O. Box 1380 Portland Maine 04104-1380

EL WIRING DIAG DC PWR SPLY

60065342

DR	HMS	DATE	5/23/23
WT	-	SCALE	-
REF	-		
A	MODEL	SCB	A
SIZE	SHEET 12 OF 13		REV

PROJECT: G.C.E.

USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8 CAGE CODE

TITLE

DWG NO.

STATUS INDICATION (GREEN LIGHT)

1	STATUS "OK"	INDICATES, WITH A STEADY SIGNAL, WHEN THE SYSTEM IS OK AND NO FAULTS ARE DETECTED
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STATUS INDICATION (YELLOW LIGHT)

1	EMERGENCY STOP	INDICATES, WITH A STEADY SIGNAL, WHEN THE EMERGENCY STOP IS ACTIVATED
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STATUS INDICATION (YELLOW FLASHES)

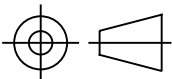
1	UPPER LIMIT SWITCH	INDICATES (ONE YELLOW FLASH) WHEN THE UPPER LIMIT SWITCH AND THE UP SIGNAL ARE ACTIVATED SIMULANEOUSLY
2	LOWER LIMIT SWITCH	INDICATES (TWO YELLOW FLASHES) WHEN THE LOWER LIMIT SWITCH AND THE DOWN SIGNAL ARE ACTIVATED SIMULANEOUSLY
3	GENERAL LIMIT SWITCH	INDICATES (THREE YELLOW FLASHES) WHEN THE GENERAL LIMIT SWITCH AND THE UP OR DOWN SIGNAL ARE ACTIVATED SIMULANEOUSLY

ALARMS (RED FLASHES)

1	PRESSURE SWITCH	INDICATES WHEN PRESSURE SWITCH AND THE UPPER LIMIT SWITCH IS ACTIVATED AT THE SAME TIME AND THE CONFIGURATION FOR THE PRESSURE SWITCH IS ACTIVATED
2	SAFETY FRAME SWITCHES	INDICATES WHEN ONE OF THE SAFETY FRAME SWITCHES IS ACTIVATED UNTIL ITS RESET BY THE UP SIGNAL
3	PUSH BUTTON CHECK	INDICATES WHEN UP OR DOWN BUTTON IS ACTIVATED DURING POWER UP
4	MOTOR OVERHEATED	INDICATES WHEN ONE OF THE TEMPERATURE SWITCHES/SENSORS IS ACTIVATED. INDICATES UNTIL IT WILL BE RESET BY THE UP SIGNAL AND THE TEMPERATURE IS DECREASED.
8	CONFIGURATION FAULT	INDICATES (EIGHT RED FLASHES) WHEN ONE OF THE DIP SWITCHES DOES NOT CORRESPOND TO OR INTERFERE WITH ANOTHER DIP SWITCH SETTING

ALARMS (PUSH BUTTON BOX) IS OPTIONAL

1	GENERAL ALARM	INDICATES, WITH A STEADY SIGNAL IF ANY ALARM IS ACTIVATED
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DR HMS DATE 5/23/23

WT - SCALE -

REF -

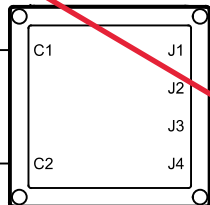
A MODEL SCB A SHEET 13 OF 13 REV

*** SEE WIRING DIAGRAM INDEX [60078722] SECTION IN OWNER MANUAL ***

POWER
SEE PAGE 2

CONTACT J1
SEE PAGE 3

COMPACT CONTROL BOX



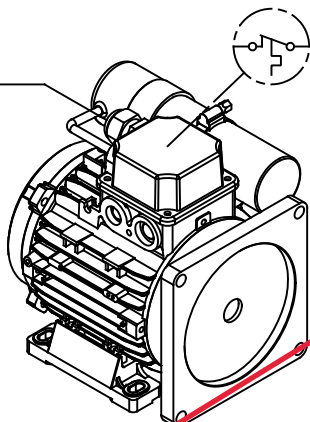
C1 PVC 4x 14AWG / 2x 18AWG
C2 PVC 3x 14AWG

J1-J3 MALE 4-POLE M12 PVC 4x 22AWG

J4 MALE 8-POLE M12 PVC 8x 22AWG

CUSTOMER
POWER SOURCE

MOTOR
1 PHASE / 17 F.L.A. MAX



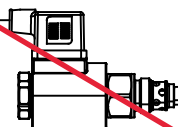
HPU MOTOR
CONNECTION DIAGRAM 60070860

PUSHBUTTON
HC1
OR
FOOTSWITCH
FS1



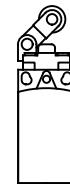
CONTACT J4
SEE PAGE 4

PRIMARY VALVE 20W

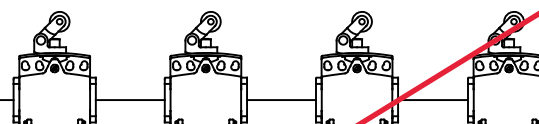


CONTACT J3
SEE PAGE 3

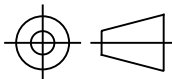
UPPER LIMIT
SWITCH
(OPTION)



CONTACT J2
SEE PAGE 3



TOE GUARD LIMIT SWITCHES
(OPTION)



3RD ANGLE
PROJECTION

UNLESS OTHERWISE
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TOLERANCES ARE
ACCORDING TO
ISO 2768-cK

DIMENSIONS ARE IN
MILLIMETERS UNLESS
OTHERWISE SPECIFIED.

SIGI

P.O. Box 1380 Portland Maine 04104-1380

DR HMS DATE 2-14-22

WT - SCALE -

EL WIRING DIAG 115 DC PWR SPLY

REF -

A MODEL CRB -

60078722

SIZE SHEET 1 OF 4 REV

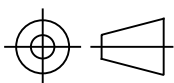
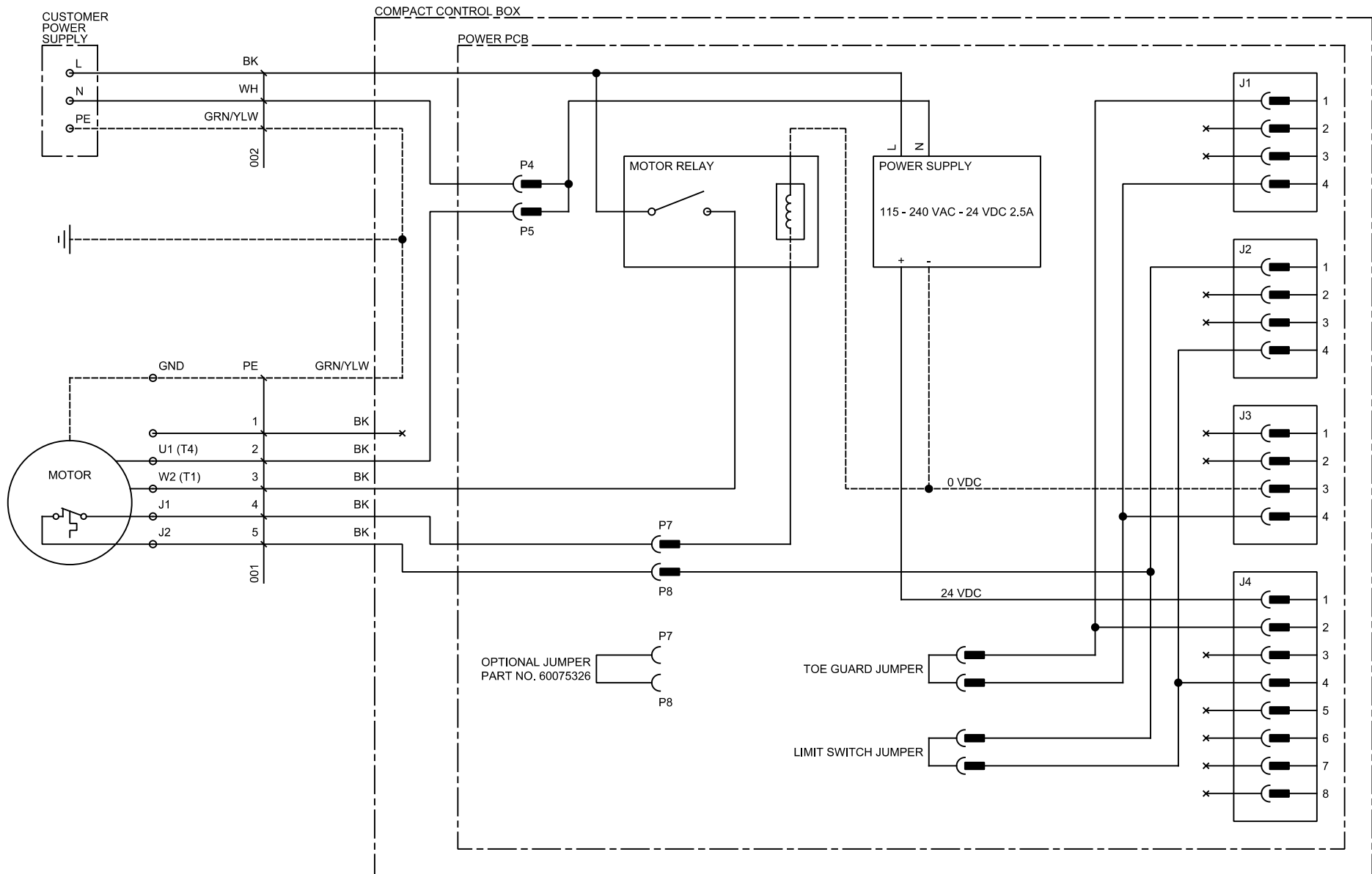
PROJECT: G.C.E.

STATUS: USE OF PROPRIETARY INFORMATION
LIMITED TO WRITTEN AGREEMENT

063Z8
CAGE CODE

TITLE

DWG NO.



3RD ANGLE PROJECTION

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PROJECT: G.C.E.

USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8 CAGE CODE

TITLE

DWG NO.

SIGI

P.O. Box 1380 Portland Maine 04104-1380

EL WIRING DIAG 115 DC PWR SPLY

60078722

DR	HMS	DATE	2-14-22
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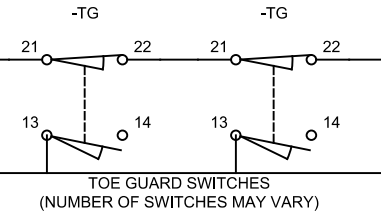
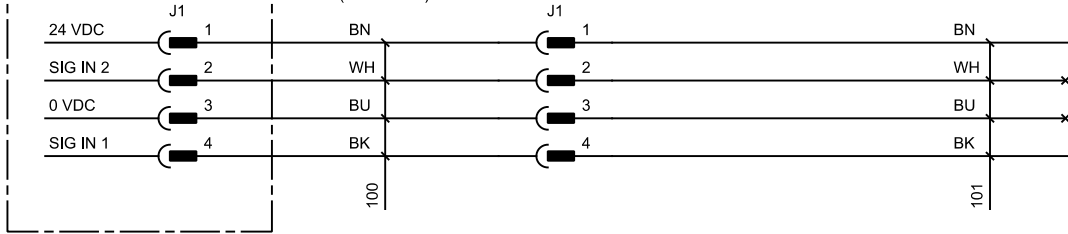
WT	-	SCALE	-
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REF	-
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A	MODEL	CRB	-
	SIZE	SHEET 2 OF 4	

COMPACT CONTROL BOX

EXTENSION CABLE (OPTIONAL)

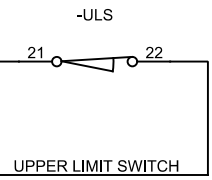
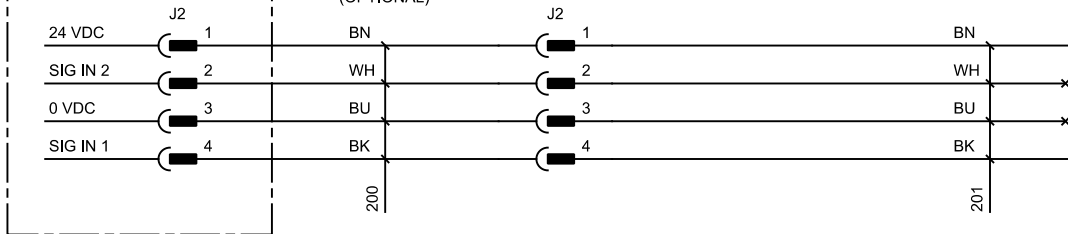


TOE GUARD (OPTION)

J1

COMPACT CONTROL BOX

EXTENSION CABLE (OPTIONAL)

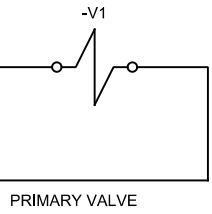
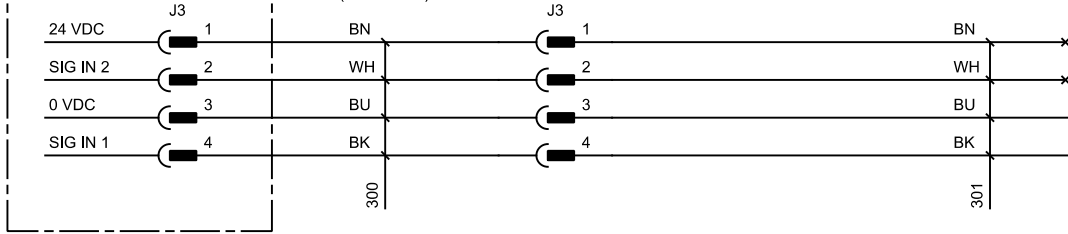


UPPER LIMIT SWITCH (OPTION)

J2

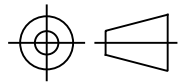
COMPACT CONTROL BOX

EXTENSION CABLE (OPTIONAL)



DOWN VALVE (REQUIRED)

J3



3RD ANGLE PROJECTION

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SIGI P.O. Box 1380 Portland Maine 04104-1380

DR HMS DATE 4-14-22

WT - SCALE -

EL WIRING DIAG 115 DC PWR SPLY

REF -

A MODEL CRB -

SIZE SHEET 3 OF 4 REV

PROJECT: G.C.E.

TITLE

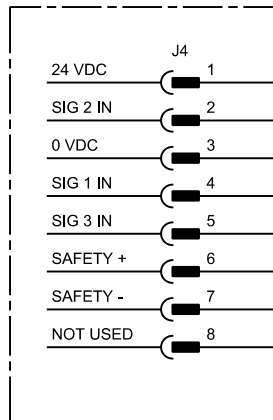
STATUS: USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8 CAGE CODE

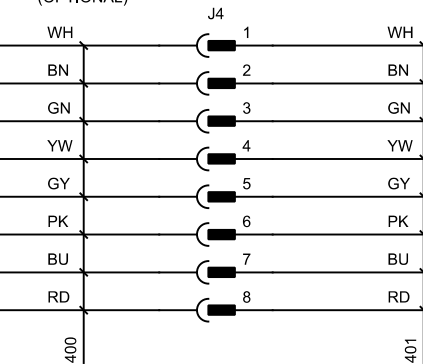
DWG NO.

60078722

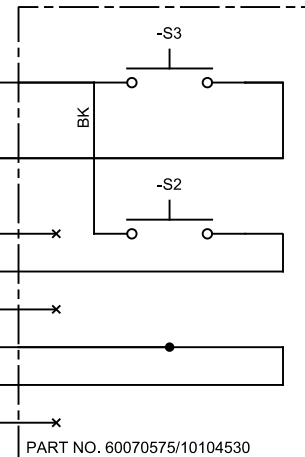
COMPACT CONTROL BOX



EXTENSION CABLE (OPTIONAL)



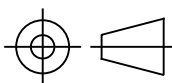
-HC1 OR -FS1



DOWN CONTACT

UP CONTACT

STANDARD PUSH BUTTON OR FOOTSWITCH



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DR HMS DATE 2-14-22

WT - SCALE -

REF -

A MODEL CRB -

SIZE SHEET 4 OF 4 REV

PROJECT: G.C.E.

USE OF PROPRIETARY INFORMATION LIMITED TO WRITTEN AGREEMENT

063Z8 CAGE CODE

TITLE

DWG NO.

60078722

STATUS: